

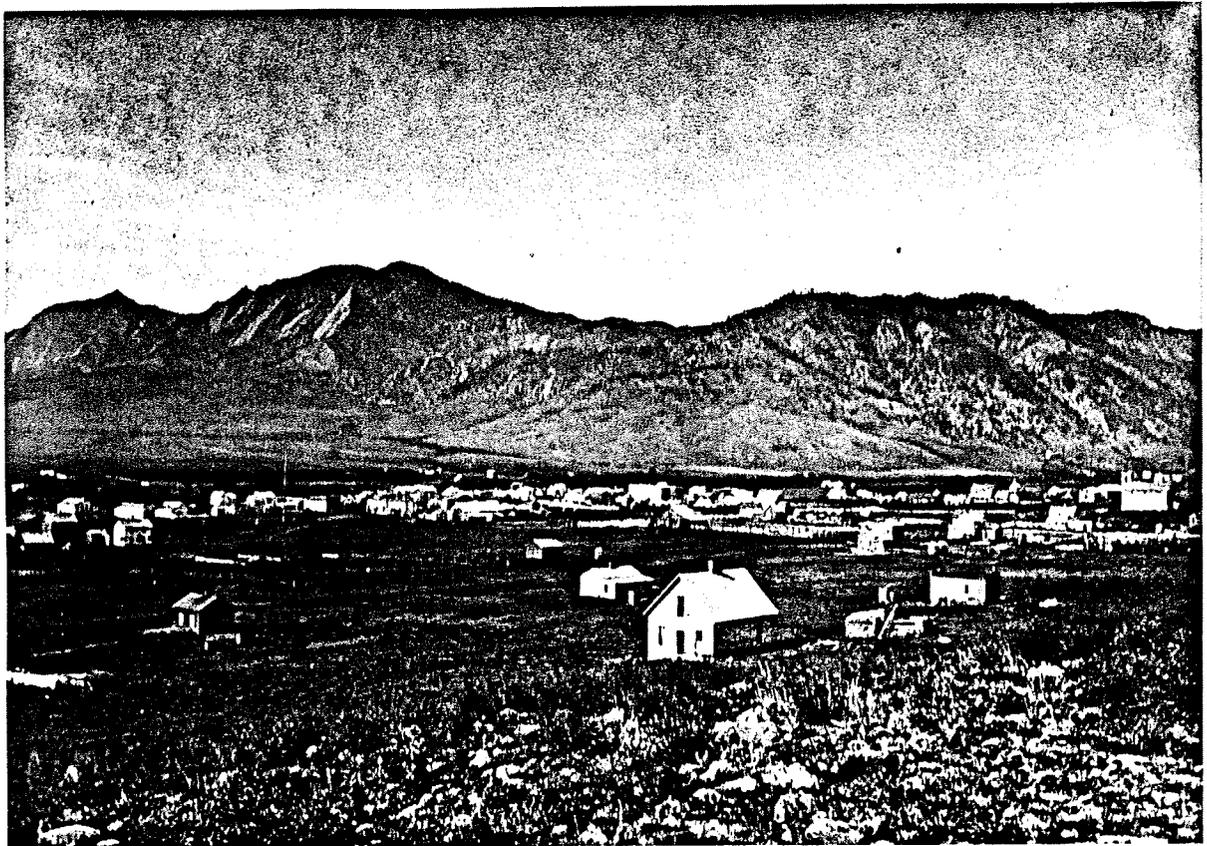
Chris Reilly

**A History of the Waterworks of
Boulder, Colorado**

by Phyllis Smith

April 1986

**David Rhodes, Director
Public Works Department
City of Boulder**



Boulder City in the 1870s.

photo, A. A. Paddock Collection

Among those cities of the semi-arid west which, laboring under... adverse conditions, have sought to secure for both present and future needs an adequate supply of pure and wholesome water, perhaps there is none which has had a more favorable opportunity so to do than the City of Boulder, Colorado.¹

Clair V. Mann, Secretary
Boulder's Charter Convention

...Boulder's water system used to consist of a glacier and sun. The sun melted the glacier into water and the water ran down the Creek into the city. Citizens put in a few pipes and pumps₂ to bring the water to them. That was it.

Andy Briscoe
Coordinator of Public Utilities

"There's no water running in the farmer's ditch, which should supply the tidy housewives of Boulder, who are grumbling considerably thereat.

Boulder Pioneer, 1869

Acknowledgments

A number of people have helped me understand the development of the Boulder waterworks: James Carmody, Willi Duchow, William Light, Everett Long, Donald Lunsford, Tom Platt.

The following librarians gave me special attention and suggestions during the course of the research: Lois Anderton, Carnegie Branch Library for Local History, Boulder Public Library, Virginia Braddock, Municipal Government Reference Center, Boulder Public Library, Imogene Easton, Central Files, City of Boulder, and Cassandra Volpe, Western Historical Collections, University of Colorado at Boulder.

Charlotte Smokler, librarian, Boulder Daily Camera, was most helpful as was Camera editor Laurence Paddock, the third generation of a Boulder newspaper family who, fortunately for us all, "saves things."

I am most grateful to Sarah Thompson Hollar for her editorial and secretarial services during the preparation of this document. I appreciate the suggestions and criticisms of Bob Wheeler, Acting Director, Utilities Division, and Steve Miller, Superintendent, Utility Maintenance, as they studied a draft of this paper.

The photographs used to illustrate this paper come from a variety of sources: the A. A. Paddock collection, files of the Boulder Daily Camera, the Carnegie Branch Library for Local Research, the Boulder Historical Society, and Western Historical Collections, University of Colorado at Boulder. Photographs from the University of Colorado were printed by Larry Harwood, M.C.D.B. Biovisuals, University of Colorado at Boulder.

Finally, I am most grateful to Andy Hollar, former Director, Utilities Division, for the opportunity to complete this fascinating study of how Boulder collected water supplies in earlier days.

The first parties of gold seekers who entered the Boulder Valley in the early fall of 1858 were pleasantly surprised to walk upon native grasses instead of sand; they had expected to see a desert landscape. Earlier reports in Eastern newspapers described the lands lying just east of the Snowy Range* as the "Great American Desert," an area unpromising for permanent settlement.**

They noted the small streams cascading down the Front Range, none of them navigable, which brought enough water to the Boulder Valley to support the native plants which fed resident buffalo, antelope, and deer. Members of the Southern Arapaho nation had known for some generations that the Boulder Valley was a good place to hunt; they spent the winter months here, sheltered by the high mountains from intense weather.

* The present name, Rocky Mountains, came into use some time after the turn of the century.

** Years of record keeping show a mean annual precipitation of 18.6 inches - 16 inches on the plains and 40 inches in the mountains.

During the spring of 1859, some of the gold seekers quickly despaired of becoming rich in the diggings above Boulder and came down to study the mountain runoff. They determined that the construction of irrigation ditches from South Boulder Creek, Boulder Creek, St. Vrain Creek, Big Thompson River, and to the north, Cache le Poudre River, would catch enough snow water to grow the area's first wheat and turnips. They dreamed of vineyards, orchards, and ranches.

These irrigation-minded settlers were not the first to dig waterways in Colorado. The Mesa Verde Indians built irrigation systems around 1200 A.D. to support a variety of crops. Nineteenth-century residents of the San Luis Valley, who had migrated from Mexico generations before, devised a system of "huertas" to water their fields outside their little towns. In 1850, these early Spanish-speaking residents built the first proper irrigation channel in the area, People's Ditch, which is still in use today.

By early fall of 1859, barely a year after the first white settlement in the Boulder Valley, a number of families claimed first rights to the melted runoff from above. (Today, those family names still appear on some of the ditch company rosters.)

Even though the early settlers had come from the States, where water rights are riparian, or tied to the land through

which the streams flow, they took their cue from those who had established water rights in California during the gold rush there a decade before. Because the West was arid and did not enjoy ample yearly rainfall as did the Eastern states, California miners and, later, the courts, determined that water rights did not automatically go with the real estate but were separate, to be claimed by those who got there first. If the miners had not established some system to fairly distribute the water, early Boulder residents might have engaged in "shovel diplomacy," a term coined by Colorado water attorney George Vranesh to describe what one miner would do if he discovered another miner diverting all the water upstream. The first miner simply "walked up the creek and hit the other miner over the head with his shovel."⁴

As it was, violence did play a part in the benchmark case, Coffin vs. Left Hand Ditch Company, which affirmed the doctrine of prior appropriation, or "first in time, first in right."

It was in 1879, and Boulder farmer George Coffin was mad. His family had held the right to divert water from Left Hand Creek since 1861. But 1879 was an exceptionally dry year and a prior claimant, the Left Hand Ditch Company, was using water to irrigate elsewhere. Coffin was downstream without water, watching his corn shrivel in the summer heat. Enraged, he and a few other farmers⁵ went upstream to the ditch company's dam and tore it apart.

But, when the Colorado Supreme Court heard the case, Coffin vs. Left Hand Ditch Company in 1882, it found that Coffin was "out of luck and out of line trespassing on ditch-company property."⁶ It ruled that the company's right to divert water was superior to Coffin's claim and the ditch company also had the right to divert water from one drainage to another, thus paving the way for the transmountain movement of water in the future.

Thus, "first in time, first in right" became the common law for the use of most Western waters. This principal was later codified as governments formed in the area. The first-come, first served rule was affirmed by the new Colorado Territorial Legislature in 1862. The same year, twenty-four ditch companies had filed for the right to divert water from Boulder Creek. Others quickly filed on the other Front Range streams.

When Colorado became a state in 1876, its Constitution stated, "The right to divert the unappropriated waters of any natural stream to beneficial use shall never be denied. Priority of appropriation shall given the better right as between those using water for the same purpose." "Beneficial use" in the Constitution gave top priority to domestic use, second priority to agricultural use, and third priority to manufacturing use.

On June 2, 1882, the first time local water rights were adjudicated, or recognized by Boulder County District Court, James M. North presiding, ninety-eight ditch companies were accorded a priority right, depending on their filing dates, to use Boulder Creek water. These rights were separate from any land owned by members of the ditch companies. (See Figures I and II.)

(By the 1890s, water users realized that the building of reservoirs to store water for future use was essential. There followed a spate of filings on the mountain lakes above the Boulder Valley. Water storage rights, as well, were separate from direct flow rights. And those who used their allotted water immediately were given precedence over those who wanted to store their water for later use.)

As was the case with many Western communities, Boulder City was slow to establish its own right to water under the Doctrine of Prior Appropriation. The little mining supply town did not consider municipal government until 1871 and only then because some residents chafed under what they felt to be dictatorial rulings by the three Commissioners of Boulder County, whose offices had been established in 1862. Boulder City was incorporated on November 4, 1871.

Ditches In Boulder Area Date Back To 1859 And Into Sixties

The Centennial of Irrigation in Colorado, to be celebrated this year in the San Luis Valley, probably at Alamosa, has created interest in the dates of ditches in this area. The Camera hopes to present a series of articles and is seeking co-operation of those in position to help.

First ditch off of the lower Boulder Creek, dates Oct. 1, 1859 for 25 second feet of flow. McGinn ditch off of South Boulder dates May 1, 1860 for 3.19 second feet, and the Autrey and Eggleston, off of Coal Creek, dates June 1, 1860 for 4.16 second feet.

Smith and Goss ditch, dates Nov. 15, 1858 for 44.30 second feet and Howell dates Dec. 1, 1859 for five second feet, are the only ones in this area along with lower Boulder prior to 1860. First settlers in Boulder arrived Oct. 17, 1859 and were seeking gold.

Court Adjudicated 98 Ditches In 1882

The priorities of 98 ditches getting their water from Main Boulder, South Boulder Creek, Four Mile Canon, Jain's Gulch, were fixed by an important court decision dated June 2, 1882. Forty three other ditches were effected by a decision June 21, 1926. There were other court decisions on a number of ditches, notably in 1907, when 18 ditches were covered.

Adjudicated Water Rights, Water District No. 6, South Platte Basin, in possession of Thomas M. Platt, water commissioner, shows that in 1860 nine ditches have Prior rights; in 1861, six; in 1862, sixteen; 1863, nine; 1864, seven; 1865, thirteen; 1866, five; 1867, none; 1868, four and in 1869, one.

Forty-seven ditches on the three main streams, Boulder, South Boulder and Coal Creek, or smaller tributaries, have priorities dated in the seventies. Fourteen have priorities in the eighties.

Anderson Ditch 17 Years Older Than CU

Anderson ditch, which flows thru University Hill, dates back to October 1, 1860, which was 17 years before the opening of the University of Colorado. North Boulder Farmers dates June 1, 1862 and Farmers from October 1 of the same year. Silver Lake (Maxwell) ditch dates from Feb. 28, 1868. The Rhea ditch off of Gregory canon dates, March 1, 1864.

There have been decreases on water for manufacturing use and several transfers of shares from one point to another. The city of Boulder, for example on December 11, 1925 secured permission to transfer four shares of Anderson, and 14 of Farmers. In 1942 the city secured permission to transfer 4 more of Anderson and an additional 14 of Farmers. City of Louisville in 1946 was given permission to transfer three shares of Howard ditch stock.

Priorities also cover reservoirs and there are many in the Boulder district, whose history will be of interest. Important decisions concerning them were handed down in December, 1900, in March, 1907, in June, 1926 and on later dates.

*From Boulder
Daily camera
February 4, 1952*

FIGURE I

Ditches In Boulder Area With Priorities Up To 1870 Listed

Irrigation ditches with decrees up to 1870 in Water District No. 6, South Platte Basin, are as follows: (all from Boulder Creek, unless otherwise designated)

Lower Boulder, Oct. 1, 1859.
 Smith and Goss, Nov. 15, 1859.
 Howell, Dec. 1, 1859.
 Howard, S. Boulder, March 1, 1860.
 Lafayette Pipe Line, transferred from Howard, March 1, 1860.
 McGinn, South Boulder, May 1, 1860.
 Jones and Donnell, S. Boulder, May 1, 1860.
 Scheerer, S. Boulder, June 1, 1860.
 Autrey and Eggleston, Coal, June 1, 1860.
 Anderson, October 1, 1860.
 Boulder City Pipe Line, transferred from Anderson, Oct. 1, 1860.
 Gooding, Daily and Plumb, April 1, 1861.
 Houck No. 2, March 1, 1861.
 Win. C. Hake, Coal, June 1, 1861.
 Martha M. Mathews, June 1, 1861.
 Carr and Tyler, Aug. 1, 1861.
 East Boulder, South Boulder, April 1, 1862.
 Harden, June 1, 1862.
 N. Boulder Farmers, June 1, 1862.
 Wellman, Nichols and Hahn, June 1, 1862.
 William Breach, June 1, 1862.
 McCarty, June 1, 1862.
 M. G. Smith, June 1, 1862.
 G. Berkeley, June 1, 1862.
 Boulder and Left Hand, June 1, 1862.
 Green, Sept. 15, 1862.
 Boulder City Pipe Line, transfer from Farmers, Oct. 1, 1862.
 Rural, March 10, 1863.
 Boulder and Weld County, April 1, 1863.
 Cottonwood Ditch, S. Boulder, April 15, 1863.
 Davidson Dry Creek, S. Boulder, May 1, 1863.
 Coalridge, transferred from Davidson Dry Creek, May 1, 1863.
 South Boulder and Coal Creek, South Boulder, May 1, 1863.
 Green, First, May 1, 1863.
 Smith and Emmons, June 1, 1863.
 North Boulder Farmers, First, June 1, 1863.
 Dry Creek No. 2, S. Boulder, May 1, 1864.
 McGinn, first, S. Boulder, May 1, 1864.
 Green, Second, May 1, 1864.
 Andrews and Farwell, S. Boulder, June 1, 1864.
 North Boulder Farmers, Second, June 1, 1864.
 Enterprise, S. Boulder, Feb. 1, 1865.
 Lower Boulder, Transferred from Enterprise, S. Boulder, Feb. 1, 1865.
 Butte Mill, March 1, 1865.
 Howell and Beasley, March 1, 1865.
 Green, Third, April 1, 1865.

Leyner and Cottonwood No. 1, S. Boulder, April 1, 1865.
 Gooding, Dailey and Plumb, First, April 1, 1865.
 Delehant, May 1, 1865.
 South Boulder and Bear Creek, S. Boulder, May 9, 1865.
 Marshallville, S. Boulder, June 1, 1865.
 McGinn, Second, S. Boulder, June 1, 1865.
 Highland South Side, June 1, 1865.
 Leyner and Cottonwood No. 1, S. Boulder, April 1, 1866.
 Enterprise, First, S. Boulder, May 1, 1866.
 Lower Boulder Cut Off, S. Boulder, May 15, 1866, with transfers from Central and South, June 1, 1866.
 McKenzie, Coal, June 1, 1866.
 South Boulder and Bear, S. Boulder, March 15, 1868.
 Leggett, May 1, 1868.
 Highland South Side, First, June 1, 1869.
 Eggleston Ditch No. 1, Coal, Oct. 1, 1869.

Decrees Were Signed In June 1882

All of the above were adjudicated on June 2, 1882, along with other ditches up to and including December 7, 1881.

F. S. Leuthi, Boulder water irrigation attorney, now retired, stated that the testimony taken at the hearings before Judge North, of pioneers as to the time they constructed the ditches and the uses of which they put the water, is missing. If the record can be found, it would provide the background for a historical story, which The Camera is seeking on irrigation in this region.

The Centennial of irrigation in Colorado is to be observed this year at Alamosa where irrigation began in 1852, six years before the first white settlers came to Boulder.

FIGURE II

In the 1870s the establishment of a town waterworks was not immediately perceived as a matter for municipal concern. A few fortunate Boulder residents used water from their recently-dug wells or springs on their property; the rest of the 2,500 residents obtained their domestic water from Boulder Creek or one of the ditches. "Wealthy" householders laid pipes, some fashioned from hollow logs, from the ditch to their residence.

A private concern, the Boulder Aqueduct Company, organized in May 1872 by Andrew J. Macky, Alfred A. Brookfield, and James P. Maxwell, was granted a charter by the Town Trustees the following November 29. The next year, the fledgling water company was given permission by the Trustees to lay wooden pipes.⁷ The three businessmen promised to "lay water pipes from Farmer's Ditch [which had been completed in 1862] along the principal streets, with pipes leading into every house where they may be desired."⁸

In 1874, however, after a mass meeting of argumentative citizens, a committee formed to decide whether a private company or Boulder City should build the first waterworks. Some wanted the private company to continue⁹ but committee members Frederick A. Squires, Ephraim Pound, and, again, Alfred A. Brookfield, pondered the question and decided that, indeed, the waterworks should be a publicly-funded concern.

They proposed an \$18,000 bond issue to build a reservoir near the mouth of Boulder Canyon, southwest of Red Rocks, on the Fox farm. On October 31, 1874, seventy-one citizens voted for the expenditures and seventeen voted against. Ephraim Pound, president of the Town Trustees and sometime sheriff and innkeeper, was appointed Boulder City's first water commissioner. (He served from 1875 to 1877.)

The following year, 1875, construction began on the Town of Boulder Reservoir (sometimes known as Red Rocks Reservoir or Sunshine Reservoir No. 1). James P. Maxwell surveyed the area and recommended the building of a wing dam near the proposed headgate. M. D. Currigan was in charge of pipe-laying and, after the first contractor defaulted, Currigan also built the storage pool, which measured 138 feet across and ten feet deep.

What should the pipes be made of, considered the waterworks builders. Wooden pipes were used in Nederland and in the Lafayette area. Perhaps iron would be a sturdier choice, they decided. They established a headgate up Boulder Canyon, on the north bank of Boulder Creek, on the Graham placer, just below the present headgate for the Silver Lake Ditch. The diverted waters flowed through a wooden flume and a three-fourth-mile ditch which John A. Ellet dug through land acquired by Boulder City from the Brierly family. Ellet charged \$2,000 for his work; since the Town Trustees had run out of money, however, they offered Ellet water



Boulder's first reservoir, built near the Red Rocks in 1875, became obsolete just a few years later. Note Old Main on the horizon, constructed about the same time. Yount's flour mill is at lower right.

photo, A. A. Paddock Collection

bonds "with accrued interest thrown in."¹⁰ The ditch measured three feet across and one foot deep with a five foot-per-mile grade.

(The Town of Boulder Ditch was adjudicated in 1882 with an appropriation date of June 17, 1875 -- the date the flume was completed -- and included a domestic right of 6.189 cfs as well as an additional 6.189 second feet for water storage rights in the Town of Boulder Reservoir. On February 9, 1904, the City of Boulder received additional rights to twenty cfs by adjudication on the construction of the Boulder City Pipeline, and, on December 31, 1947, acquired rights to another ten cfs. Rights to twenty more cfs were affirmed upon completion of Boulder City Pipeline No. 3 on May 15, 1956.)

Before the water flowed into the reservoir, it seeped through a sand filter. From the storage pool, the water flowed down to Pearl Street by means of a curved castiron eight-inch pipe. The first pipe was laid to Twelfth Street (Broadway). Later, another eight-inch pipe was run down to the public square (site of the Boulder County Courthouse) which lay 160 feet below the elevation of the reservoir. Boulder did not replace some of these earlier pipes until 1917 when Pearl Street was paved for the first time.

Many Boulder residents got their water at the public square. The trip to town became a social event; citizens took time to visit, perhaps watch a baseball game between Boulder City and Sunshine, and then trudge home with full pails. Now it was possible to install a few fire plugs with a two-and-one-half-inch capacity.

For the first time since settlement eighteen years before, Boulder's hose companies had some chance to put out one of the town's frequent fires rather than stand and watch a wooden building burn to the ground. "...The pressure on the water is enough to throw it over any house that ever will be built in Boulder."¹¹ Boulder's fierce seasonal winds made the possibility of a fire a frightening but common prospect.

Soon, another bond issue of \$12,000 was required to lay laterals to Spruce and Pine Streets. Twelve additional fire hydrants were installed; now the firefighters had 140 pounds of water pressure for their hoses.

But the project was patchwork and a constant source of trouble. A contractor promised the Town Trustees he would "make tight all joints, connections, and hydrants now leaking or that may be found to be leaking within twenty days."¹²

When foundryman J. W. Develine ordered his pipe connection, only a trickle of water dropped from his new faucet. Upon investigation, a quantity of swollen corncobs stuffed into the street pipes explained the lack of water.

In 1877, a "diversion" was built from downtown back to Boulder Creek, so that the water collecting in the streets might "flow" back to the stream. The following year, another \$30,000 was spent to patch up the water system, now a five-mile line, but the town's water became more and more clouded with mine tailings from the gold and silver workings above.

A waterworks ordinance was passed the same year and included a rule to alleviate pollution from other sources: "No person shall put any carcass or filthy animal or vegetable matter into the reservoir nor shall any person bath or swim therein or skate upon the ice which may form thereon in cold weather."¹³

With a waterworks in place, a number of businesses turned to water power for their enterprises. Andrew Douty's grist mill and waterwheel had been using Farmer's Ditch water all along to grind flour for Boulder bread. In 1874, the Boulder County News ordered its first typesetting machine which was powered by water. A pipe organ, installed by the Presbyterian Church later on, in 1898, also depended upon water power for its hymns and processional. Slowly, pipes were laid to schools and other public buildings.

Now the thirsty shopper could drink from fountains downtown. A few house-holders erected ornamental fountains in front of their homes -- Boulder's status symbols of the 1880s.

At some point, the early waterworks included cobblestone ditches, which measured two feet wide and eight inches deep, and which bordered Pearl and neighboring streets -- quite a novelty for tourists. These small ditches served to water horses, wandering cattle and pigs, provided a little water for firefighting, as well as a quantity to settle the summer dust from the streets. Perhaps the greatest benefit was to Boulder's small boys who washed their feet in the cobblestone waterways.

By 1879, the reservoir was declared inadequate for Boulder's growing needs. As a stop-gap measure, the Town ordered that the reservoir be enlarged to a depth of eighteen feet, a width of 150 feet, and a length of two hundred feet. However, the Town Trustees continued to discuss the need of a new reservoir at a better location.

Sometime in 1880, Boulder firefighters again complained of only ten pounds of pressure in some of the hydrants; one cast iron main was dug up at Twelfth Street to determine the problem. Inside the pipe, they found a five-foot length of wood, four and one-half inches wide, wedged in such a way that only two and one-half inches of pipe were available for water flow. A mystery as yet unsolved.

Even with improved water flow, Boulder residents were asked to curtail their lawn sprinkling during dry spells. By 1883, pipe had been paid to Twenty-first Street, site of the town's first railroad depot. Frustrated with continuing pipe problems, Council* proposed another \$50,000 bond issue to improve the waterworks. It seemed, however, that the system could not be "improved in part, but must be made entirely anew."¹⁴ "The water question is getting to be a serious one."¹⁵

Most of Boulder was still drinking untreated creek water even though it was becoming more and more clouded with tailings from the mines above. The Herald recommended that the water be taken out at a higher point in the canyon to avoid mining debris.

By 1880, Boulder had acquired eight shares of Farmers Ditch water, but not without several false starts. On October 23, 1879, the Town Trustees set aside fifty dollars to buy twenty shares of ditch stock. Very much amused, officers** of the Farmers Ditch Company said, no thank you. On November 3, 1879, the Town Minutes show that \$1,000 was reserved for ten shares of ditch stock. Again, the ditch officials backed off. By January 5, 1880, however, the Town of Boulder had bought three and one-half shares of Farmers Ditch water; the following month, another four and one-half shares were acquired. Cost: \$800.¹⁶

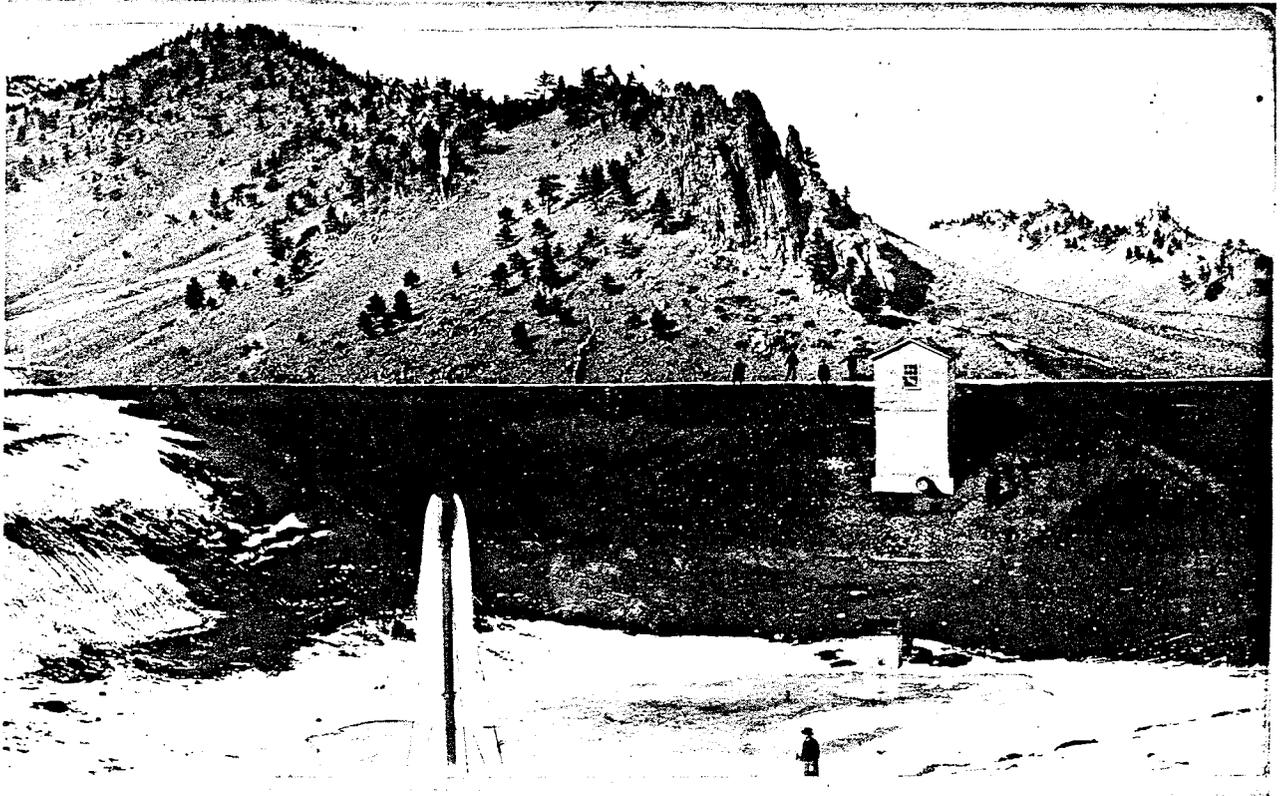
* With re-incorporation in 1882, under the jurisdiction of the new State of Colorado, the town of Boulder City became a "city," by definition, trustees were now called aldermen, and their body was termed the City Council.

** James P. Maxwell, Austin Smith, James H. Carle, Joseph Wolff, and Frederick A. Squires.

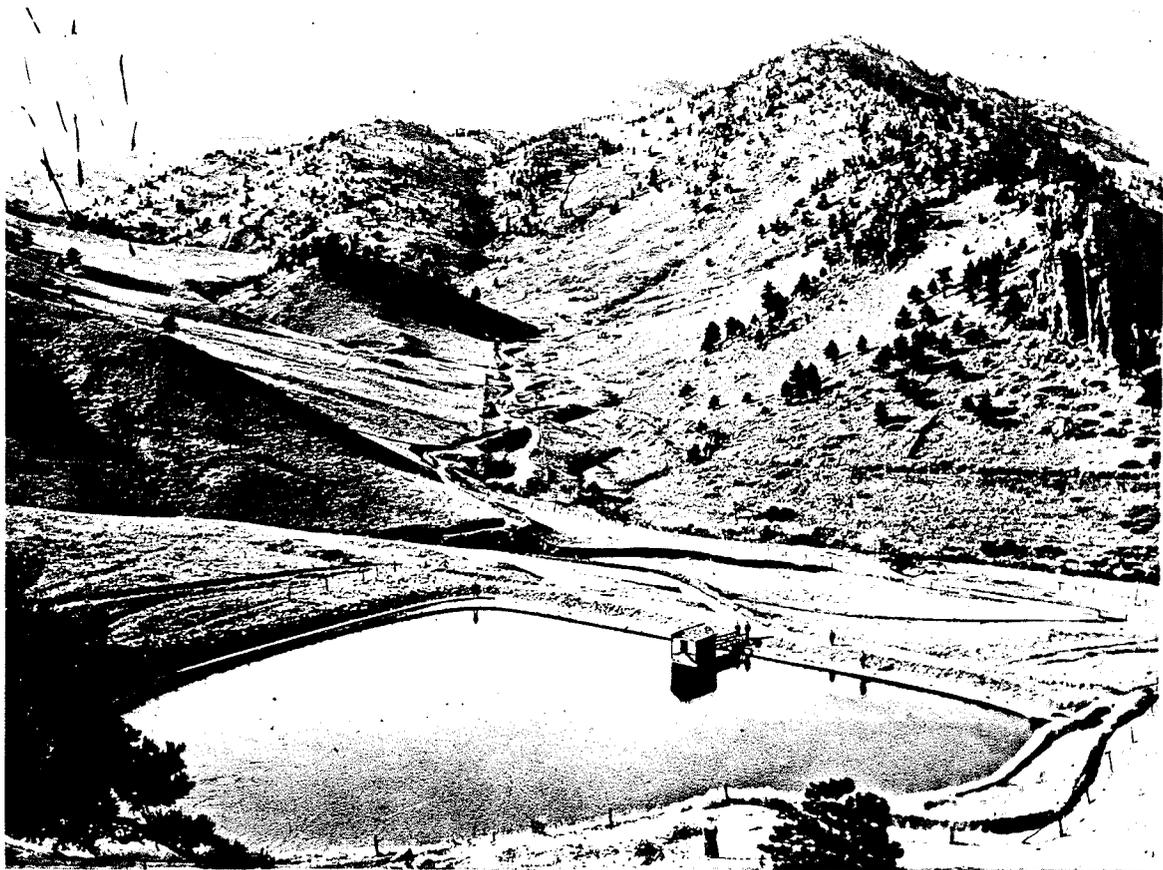
(The appropriation date for Farmers Ditch is October 1, 1862, with a decree of 5.57 cfs originally allowed the Town of Boulder. By the 1960s, Boulder City had acquired, largely by transfer, 14,586 cfs. Eight shares of New Anderson Ditch water were acquired in 1886 for \$400; the appropriation date is earlier -- October 1, 1860 -- with a decree of two cfs. Later that figure rose to 11.998 cfs by transfer decrees. One argument to the Territorial Legislature that Boulder be chosen as the new home of the University of Colorado was the town's proposed gift of ten shares of New Anderson Ditch water to the young educational institution; its curious irrigation system is still used on campus.¹⁷ The City also received 101 shares of McCarthy water [the appropriation date is June 1, 1862] with a .468 cfs decree in exchange for a city lot.)

The Farmers Ditch water thus acquired was used primarily to flush out the gutters and "clean" the streets. In fact, the water was allowed to run down the streets for no discernible reason, where it formed "nauseating puddles."¹⁸ In 1884, the Herald complained that Boulder water was "murkier than ever." That year, the waterworks was turned off entirely for a time when dead horses were found in the creek upstream.

Despite these problems, Boulder continued to drink the water. A physician recommended that households filter their drinking water and a university professor suggested a formula of



Sunshine Reservoir starts to fill.
photo, A. A. Paddock Collection



Sunshine Reservoir, built in 1891.
photo, A. A. Paddock Collection

alum and soda which, he said, would "settle ninety-five percent of the dirt in twenty minutes."¹⁹

After ten years of use, the Town of Boulder Reservoir had become totally inadequate for Boulder's growing water needs. A group of enraged citizens visited Council in 1886 to demand a new reservoir. Amid great controversy and debate, a \$150,000 bond issued passed in 1890 -- 459 to 39 -- which residents hoped would clear up the water problem for good.

The following year, excavation began on a new reservoir, located nearer the base of Sunshine Canyon on Gallup Ranch land, newly acquired by the City. The site was one hundred feet higher than that of the old reservoir; dirt from the excavation was carted down to Pearl Street to fill in potholes.

Heeding the advice of the Herald, intake for the new reservoir was moved further up Boulder Canyon to a natural settling basin -- presently called Horseshoe placer -- above Orodell, just beyond the point where Four Mile Creek joins Boulder Creek. Waterworks personnel built a crude dam of cement sacks and constructed a wooden flume of yellow pine which measured two hundred feet long, four feet wide, and three feet deep. (This intake was sometime called the Lower Intake, or the Blanchard Intake, since the owner of Blanchard's Inn [now the Red Lion Inn] homesteaded the area).

New piping from the intake to the reservoir was laid on higher ground, which required another purchase of Brierly land in 1890.

Sunshine Reservoir could hold five million gallons of runoff water. Flagstone was used to pave the sides of the new storage pool; a little stone tower, probably containing a control headgate, was constructed near the center of the reservoir and was connected to land by a rickety wooden pier. A new twenty-inch pipe was laid to town by March 1891.

One merchant was so thrilled with the prospect of clean water that he offered a sale on "the greatest bargains in Pure Toilet Soap ever known."²⁰ Plans for the new reservoir were somewhat deficient, however, because no one at first thought to line the bottom with cement. The newly-established Daily Camera described a trip by Councilmembers to the "much-maligned reservoir" and referred to it as the "mud and microbes project."²¹

Finally, after extensive discussion in Council chambers, Sunshine Reservoir was lined, but the City asked residents for an additional \$50,000 bond issue in 1893 (the vote was 278 to 55), even though it had not yet spent all of the original \$150,000 in what the Daily Camera called a "gaudy show of economy."²²

Continued population growth in Boulder forced the town to re-open the old Town of Boulder Reservoir for a time. Again, complaints of murky water. The Water Superintendent (his title had changed in 1887 from Water Commissioner) solved the problem, at least temporarily, and called for the use of Sunshine Reservoir water during the day when the customers could see it and the use of old reservoir water at night when they could not.

The Lucky Two Tungsten Company operated a mill near the old reservoir. Other tungsten mills had opened upstream as well, causing City officials to discuss for the first time the possibility of piping up to the purer waters of North Boulder Creek. On March 3, 1890, a committee formed with the charge to look into the matter of North Boulder Creek water acquisition.

North Boulder Creek was not the only source for future Boulder water supplies under consideration at the time. Boulder attorney Hiram Prince spoke to the Colorado General Assembly in 1889:

Gentlemen, Colorado's surplus waters are on the Western Slope of the Continental Divide, the lands available for their use are on the Eastern Slope. I want an appropriation of \$25,000 to find a route for bringing these waters across the mountains where they can be used.

The Assembly gave the state engineers \$20,000 to pursue various routes across the mountains. What became of this venture is lost to history. An idea forty-eight years before its time.

With a fair amount of bond issue monies now at hand, the City concentrated upon improving the water supply lines in 1894. Lines to University Hill and Chautauqua were fed water by a steam-powered pumping station, located at Ninth Street and Aurora Avenue, because gravity alone could not deliver water with enough force to those areas. It took a number of years, well after the turn of the century, to re-design that portion of the waterworks so that the pumping station was no longer needed.

Waterworks improvements must have helped for, in 1896, Daily Camera editor Lucius C. Paddock printed a Shelton, Iowa, visitor's description of Boulder water:

The city water supply comes from an open reservoir two to three hundred feet higher than the town, which is supplied through pipes reaching several hundred feet still higher, several miles "up the mountain." It is snow water and the cleanest, purest, and softest water we have ever seen.²⁴

Even so, in 1897, a local laundry sent the City a bill totaling \$7.50 for "hauling water while city water was muddy."²⁵ Council considered the bill and paid it.



Chautauqua's summer visitors come to view the newly-built reservoir. J.B. Sturtevant photo, A. A. Paddock Collection

Just before the turn of the century, as Boulder grew to a population of 6,600, the town became "water conscious" once more. More pollution from the gold and silver mines befouled Middle Boulder Creek water. The processing of tungsten had become a major industry in the canyon. Not only did the citizens realize that steps must be taken to insure that their water supply was ample and of good quality but also they voted in the town's first sewer bond issue in 1895. Sewer bond issues had been voted down with regularity since Boulder City first incorporated in 1871.

By 1898, Council saw a need of a second reservoir at the south end of town. By 1902, Chautauqua Reservoir* was completed with two sources of water supply. A ditch had been dug from Gregory Canyon to catch that runoff and a line was laid from Boulder Canyon pipes as well.²⁶ Two years later, the new reservoir was lined.

Now Boulder began to collect water rights, storage rights, and watershed lands in earnest. Council commissioned University of Colorado chemists to conduct a water purity study. For those results, see Figure III.

In 1902, water use had to be restricted due to drought conditions. Water-powered motors in printing plants and other industries were shut down. Heavy water users were told to conserve. The dry year, as well as Boulder's increasing

* not to be confused with the present Chautauqua Reservoir, built on higher ground in March 1922.

Sanitary Analysis

Tap water in Boulder, Aug. 27, 1902.

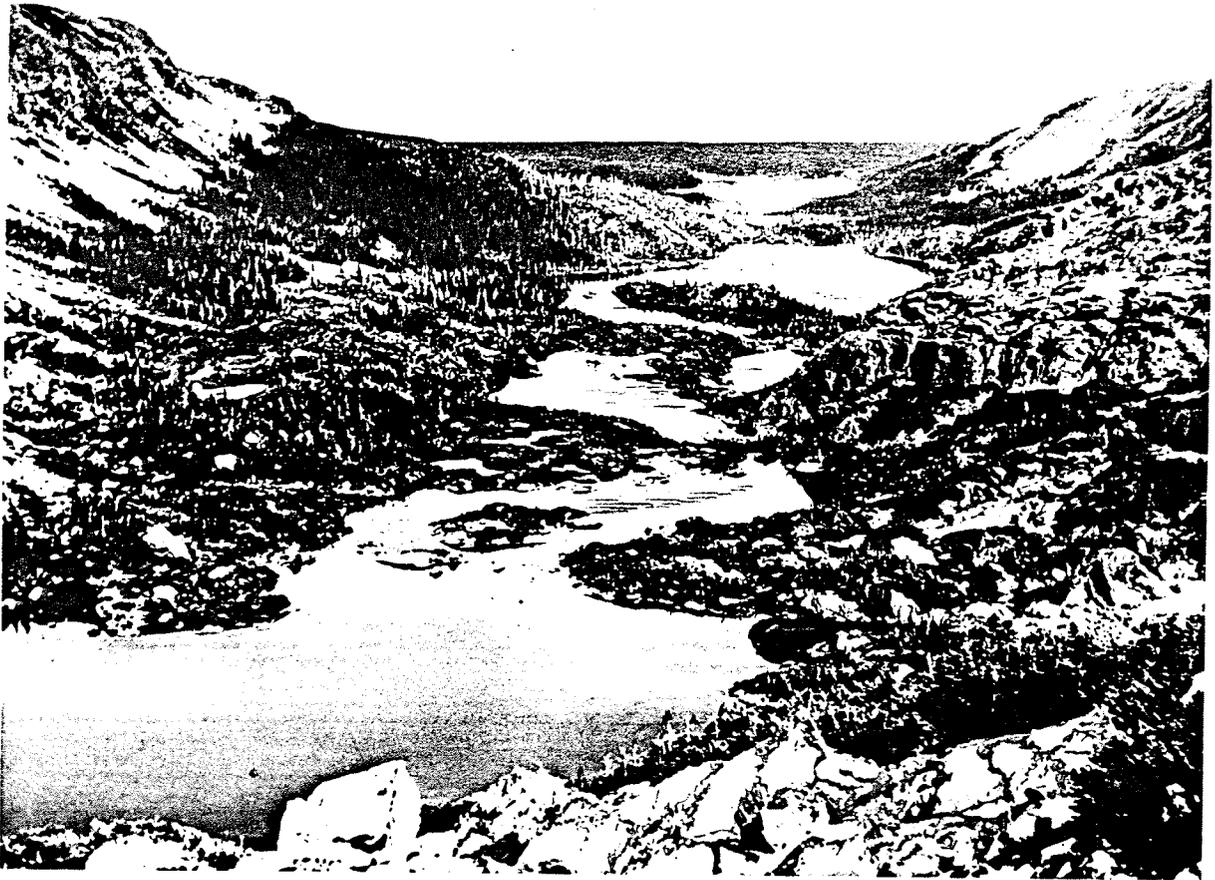
Chemical Laboratory, University of Colorado.

Parts per million.

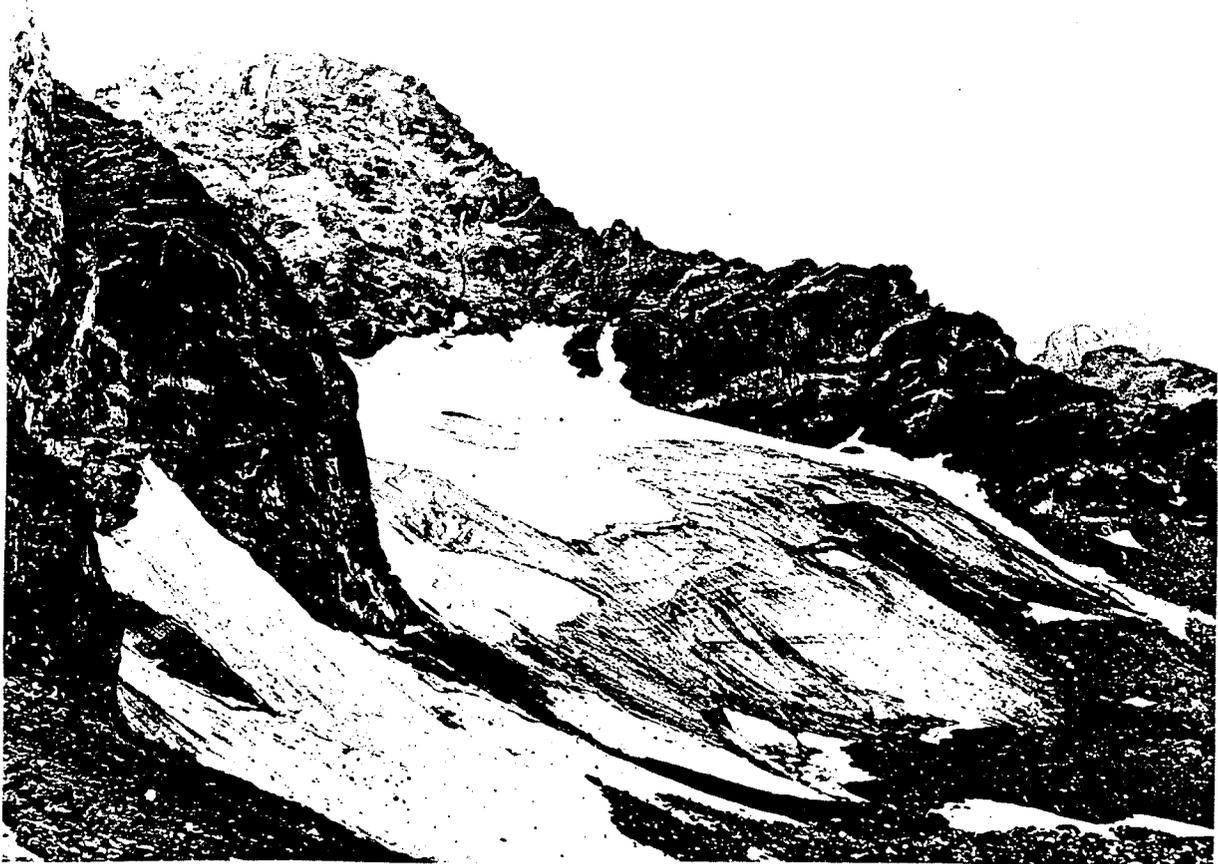
| | |
|----------------------|--------|
| Total solids | 40.000 |
| Chlorin | 2.970 |
| Nitrogen as Nitrates | 0.100 |
| Nitrogen as Nitrites | None |
| Saline Ammonia | Trace |
| Albuminoid Ammonia | 0.050 |
| Oxygen consumed | 1.170 |

FIGURE III

from Ford, Howard Carlton and Moore, George H.: "An Investigation of the Present Water Supply of Boulder, Colorado and a Design of Some Needed Changes and Additions," Bachelor of Sciences thesis, University of Colorado at Boulder, 1904.



Looking east from the glacier at newly-acquired mountain lakes. photo, Western Historical Collections, University of Colorado at Boulder.



Arapaho Glacier. photo, Western Historical Collections, University of Colorado at Boulder.

population, strengthened Council's determination to move its pipeline intake up to North Boulder Creek. Had Councilmembers known that one million dollars would be spent in the next several years on the waterworks, they might have had faint hearts about the project. The group spent a day in the mountains near Silver Lake to survey the possibilities.

In January 1904, Council negotiated for its first purchase of water storage rights -- Triple Lake, Oval Lake, and Goose Lake -- from Clint J. Maxwell, James P. Maxwell's son, who had been granted this acreage at some point* by the United States. For some reason, Council ordered the issuance of fifteen separate warrants of \$1,000 each on January 6 to pay for the mountain lakes.

(Goose Lake decrees were adjudicated on October 1, 1901, with the right to store 198.5 acre feet and on September 3, 1906 with the right to store 261.2 acre feet, with further storage rights to 576.6 acre feet affirmed on December 31, 1907.)

The Silver Lake Ditch Company had been in operation since the 1880s, with James P. Maxwell and George S. Oliver as principals. The men had completed the ditch in 1888 and had constructed a little earthen dam on the east side of Goose Lake as well as low rock-filled timber-crib dams on Island and Silver Lakes.** The dams were not sufficiently deep to hold much water

* Clint Maxwell's deed from the United States Land Office is dated 1906 which leads one to ponder, "Did he sell it before he bought it?"

** The water entrepreneurs officially received title of these lands in 1896.

but provided proof of diligence to the court by Maxwell and his associates. Since their real estate holdings in town were considerable, the availability of water to prospective buyers of land was an attractive selling point.

In the 1890s, Maxwell planted silver maples throughout the Mapleton Hill area; the saplings got off to a good start when Silver Lake Ditch laterals were run down Hill Street (now Mapleton Avenue) to water trees and newly-established gardens.

In 1903, financier Maxwell proposed to the City that they form a public-private partnership with regard to the storage rights in Island and Silver Lakes. An idea before its time. Needless to say, Council was very interested in the Maxwell proposal; they knew they needed greater control of the watershed. The Boulder News-Herald was for it; the Daily Camera was against it. Discussion stopped, however, when the proposal was disapproved in the courts.

Maxwell and his associates then negotiated with the City for purchase of some of the storage rights to the two lakes. Public discussion heated up again. After all, Maxwell was the City Engineer; collusion was charged. In January 1906, however, after several yes-and-no sessions, Boulder bought a portion of storage rights in Silver and Island Lakes for \$46,000 (\$12,000 for Island Lake and \$34,000 for Silver Lake).

(Adjudicated decrees for Silver Lake included a right to store 807.3 acre feet, dated September 23, 1887, and an additional refill right to 807.3 acre feet dated September 3, 1906. More storage rights were acquired in later years. Island Lake's first decreed water right to 371.8 acre feet was dated July 15, 1890 and the second decree for another 371.8 acre feet was dated September 3, 1906.)

All other rights and obligations remained with the Silver Lake Ditch Company, including the right to the top fourteen feet of water in Silver Lake and the top nine feet of water in Island Lake. In 1908, when the City rebuilt the dam at Goose Lake, road building was required from Goose to Silver Lake; Maxwell paid the City one dollar for a quit claim to that area. The following year, the real estate man sold the rest of his Silver Lake holdings to the Degge family for \$25,000. (For City-owned watershed land, see Figure IV.)

Now that Boulder owned the lakes lying just below Arapaho Glacier, Council ordered a survey to determine the best route for a steel pipeline from the Lower Boulder Falls to the Upper Boulder Falls, four miles below Silver Lake.

From that time until September 1909, City Engineer Fred A. Fair and Water Superintendent W. W. Wells guided the construction

of the City's new steel pipeline on high ground but following the Middle Boulder to the fork, and on up the North Boulder, some fifteen miles, to the Boulder County Ranch at Lakewood,* site of the Primos Mill, a tungsten producer.

From Orodell upstream, the crew laid twelve-inch pipe for 3,800 feet, followed by fifteen-inch pipe for 16,800 feet, and completed the line with eighteen-inch pipe for the final 27,000 feet to a twenty-acre settling basin on the Boulder County Ranch.

By October 1907, Superintendent Wells took the water line across Como Creek, which had been diverted so that its polluted waters would not mix with the purer waters of North Boulder Creek. From there, they dug an inlet to North Boulder Creek. (See Figure V.)

The \$155,000 expended for the pipeline was a mammoth outlay for such a small town. Council knew, however, that this was just the beginning of larger expenditures for the watershed.

City leaders were well pleased. The acquisition of watershed land was falling into place. With a grant from the United States government in 1907, signed by President Theodore Roosevelt, some 2,600 acres of watershed land were now City of Boulder property and included some Albion and Green Lakes territory on the north branch of North Boulder Creek. Now work had to be evident to all

* now known as the Caribou Ranch

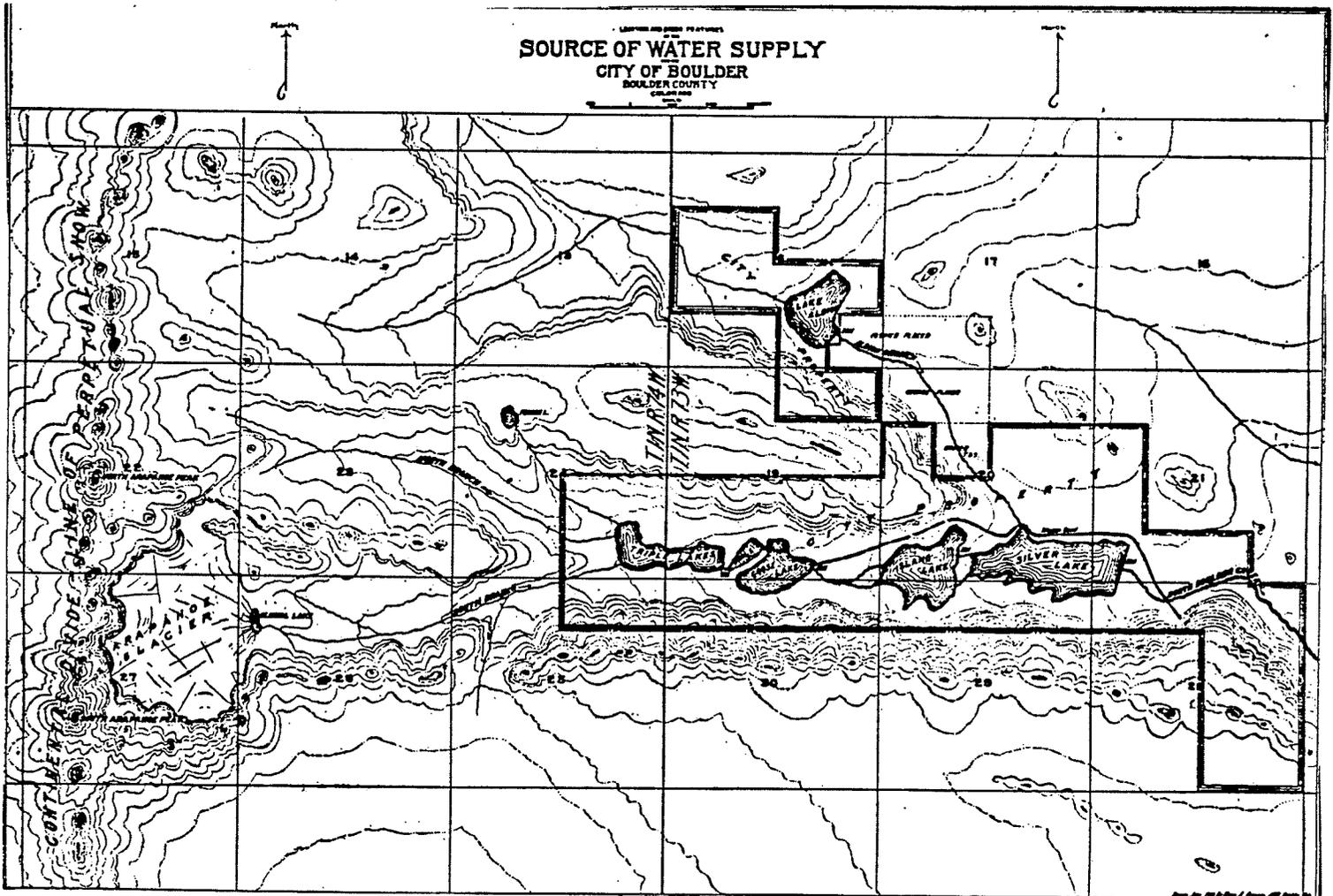


FIGURE IV

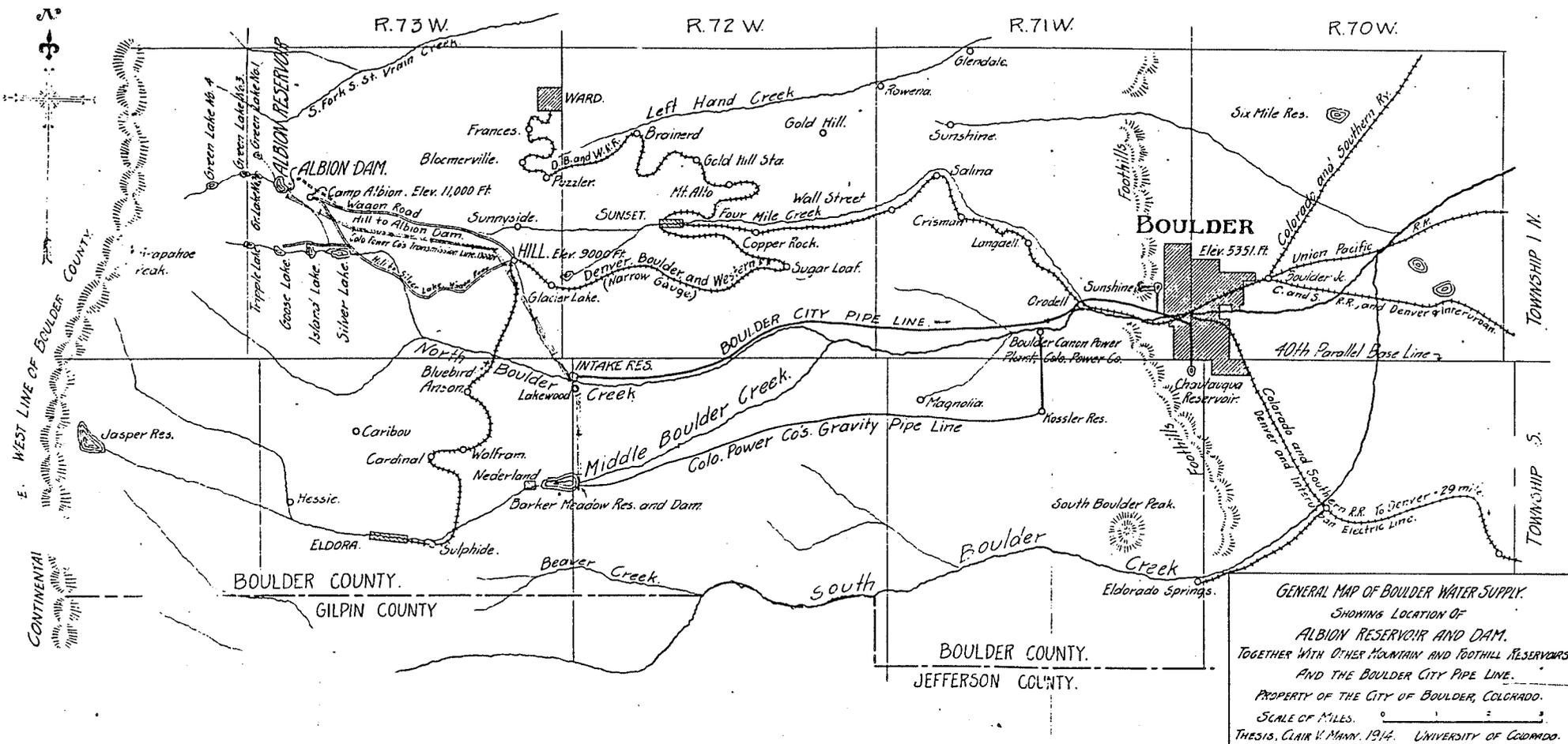
"Source of Water Supply, City of Boulder" by Henry A. Drumm from Boulder County Miner, June 10, 1910

of the newly-acquired sites to prove diligence in water court. That same year, a small outlet channel was dug at Triple Lake.

Meanwhile, in Boulder itself, water employees replaced pipes, first in south Boulder in 1904 and then in north Boulder in 1905. They installed split pipelines from the Lower Intake at Orodell; a sixteen-inch line swung north to Sunshine Reservoir and a twelve-inch pipe ran to the Chautauqua Reservoir. A twelve-inch pipe went down to the business district. A number of engineers, both in and out of Boulder municipal government, called for a metering of water at this time, both to conserve supplies and to sell "the rents" at a fairer rate, but nothing was done immediately.

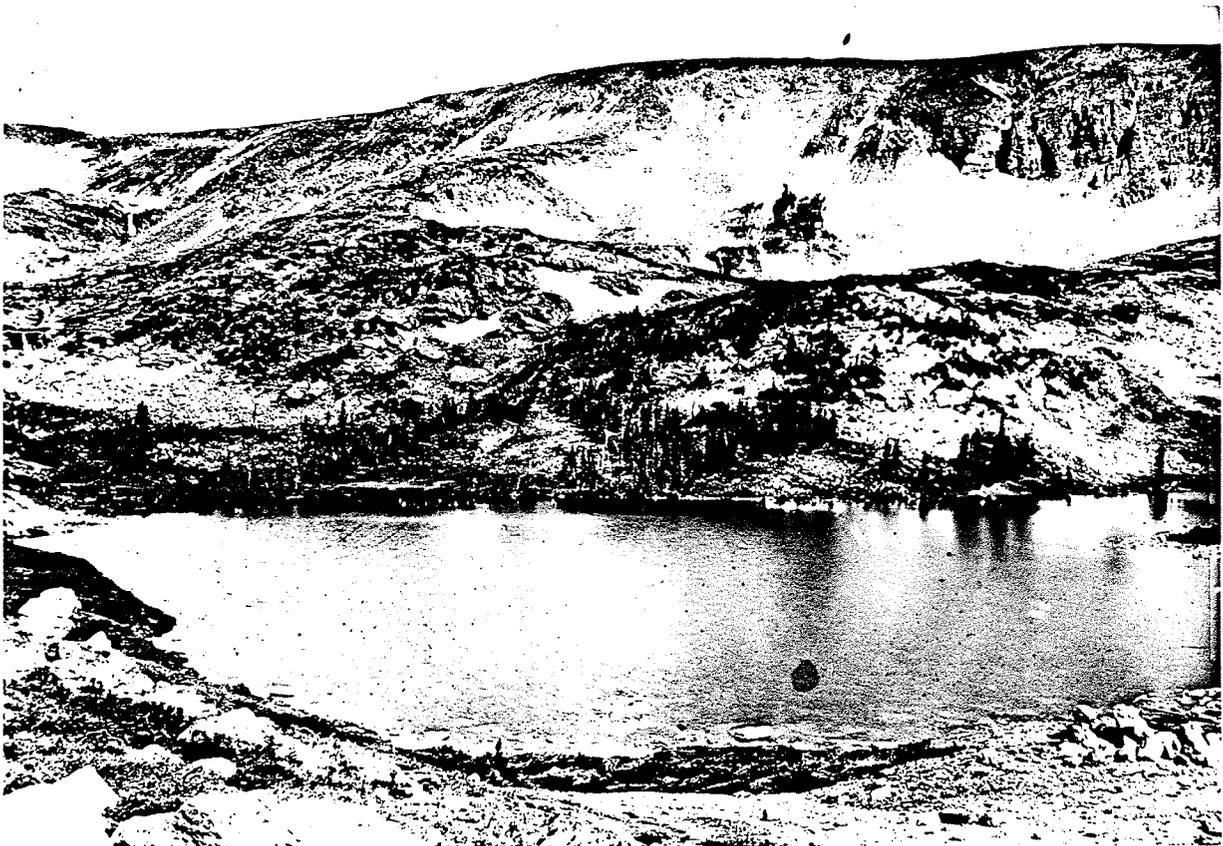
The City's first serious purchase of water rights along the north branch of North Boulder Creek was at Lake Albion in October 1907, site of an earlier silver and asbestos operation. Some feared that the Cashier Mine might become active again. (Boulder had bought a small land parcel from E. P. Hill for \$400 the year before.) The ever-present James P. Maxwell, who had recently bought the Albion rights from E. S. Housel, turned around to sell the lake to the City of Boulder. (Maxwell was still the City Engineer.) Boulder also acquired a 160-acre tract of Silver Lake from the Wood family for \$1,500.

FIGURE V

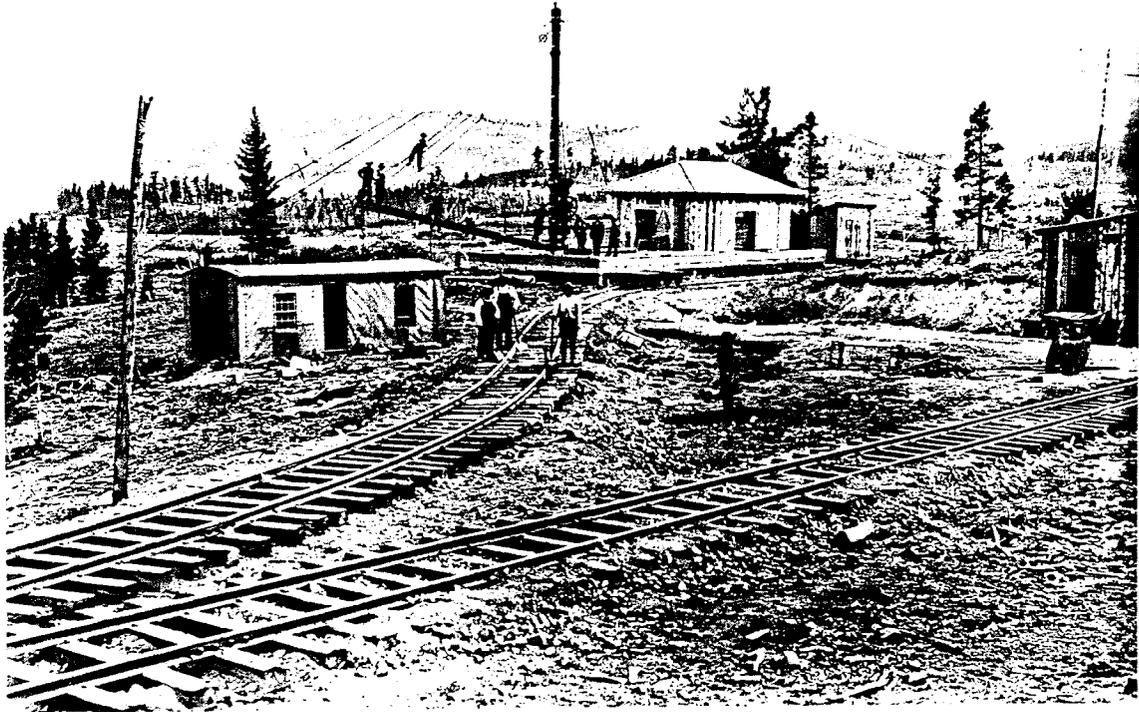




Camp Albion, a mining settlement before the turn of the century. photo, A. A. Paddock Collection



Before the dam at Lake Albion, June 1910. photo, Western Historical Collections, University of Colorado at Boulder.



Completed warehouse and switch, Hill Siding, Albion. photo, Western Historical Collections, University of Colorado at Boulder.



Dumping a car of concrete at Albion Dam. photo, Western Historical Collections, University of Colorado at Boulder.

(Decrees were not adjudicated for Lake Albion at this time, nor were they for Triple Lake to the south because Boulder could not provide evidence of sufficient diligence at those sites. In the 1926 adjudication, however, the City was awarded storagerights to 1,110.9 acre feet for Lake Albion with an appropriation date of July 1, 1910.)

When road-builder Nels Jacobson replaced the modest earthen dam at Goose Lake in 1908 with a rock-fill timber-crib structure, thirty feet high, costing \$26,245.65, fifty-five million gallons of water could be contained there. Oval Lake was no more; the new water level covered the small lake site. The log-and-timber dams at Island and Silver Lakes were strengthened at their existing heights (Silver Lake was sixteen feet high with a thirty-five million gallon capacity), but proposed new dam facilities at those points were delayed due, in part, to the existing rights held by the Silver Lake Ditch Company. Moreover, plans for new structures were not well-conceived; a contractor hired for the work quit before much had been done.

Just above town, the old wooden flume at the Lower Intake near Orodell was rotting; City Engineer Fred Fair recommended its repair to keep the City's rights to water firm in the courts.

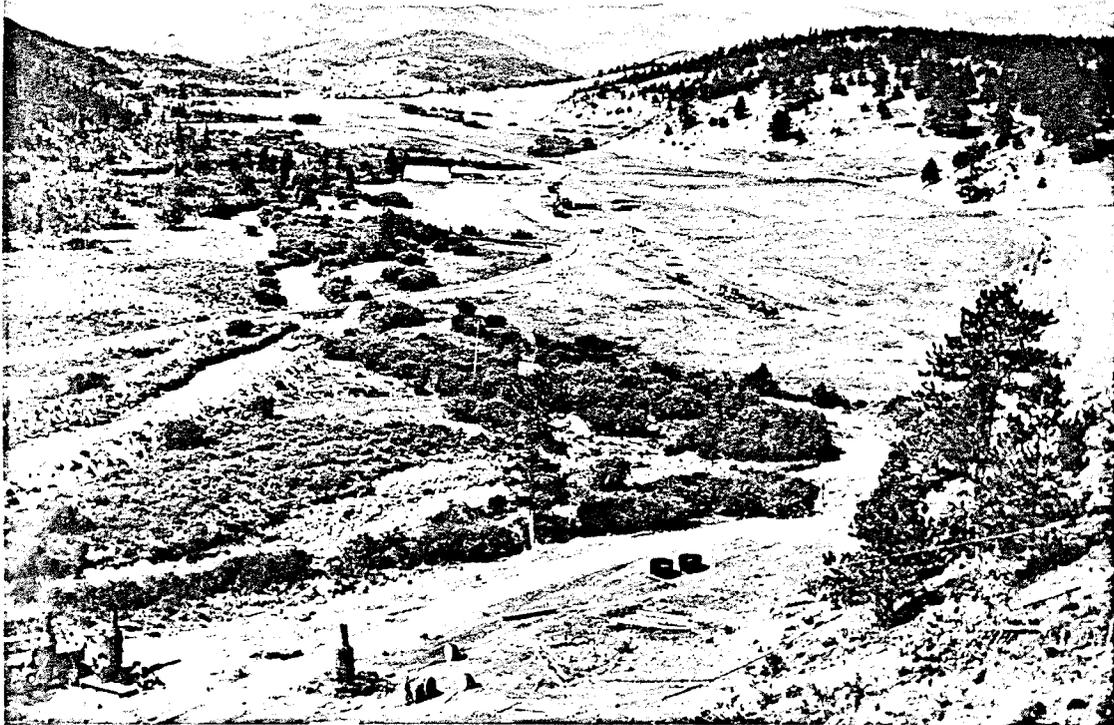
More trouble in the form of a March 14, 1910 forest fire in the mountains from lightning caused the spruce timbers at Goose Lake to burn; the dam at Silver Lake was also affected.

Surveying for a possible sixty-foot rock-fill dam at Lake Albion began in 1907 under the direction of City Engineer Fred Fair. Plans included an outlet channel, a bunk house, construction plant, and other improvements. The road from the lake to Hill Siding needed repair and a new road was constructed to Silver Lake. By 1911, two-thirds of the preliminary work had been done at a cost of \$210,000.

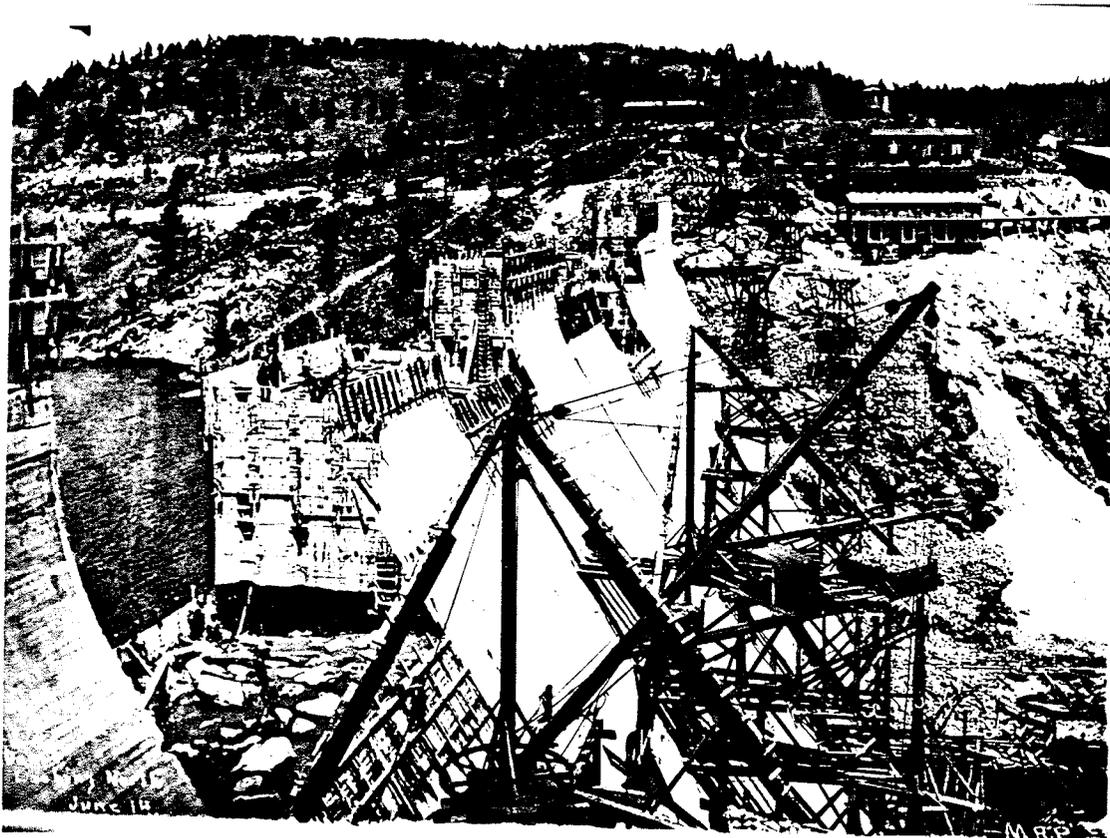
A young assistant city engineer, Clair V. Mann, studied the possibilities for dam construction at Lake Albion and completed a thesis on the subject for his Bachelor of Science degree at the University of Colorado. When he suggested to his superiors that a masonry-type dam at Albion might be appropriate, they wanted to see some plans.

Mann finished several versions, each containing thorough cost estimates and construction drawings, carefully executed. Although he helped with construction for a number of summers, he resigned after an argument with construction boss W. W. Hamm. Then Hamm resigned, followed by City Engineer Fred Dungan, followed by City Engineer H. E. Phelps, who again hired Clair Mann to finish the construction of the Albion Lake dam.

Start of Construction on Dam at Nederland, 1909.



McClure-Danver photo, A. A. Paddock Collection.



Construction site looking north, June 14, 1910, Barker Dam.
photo, A. A. Paddock Collection.

With the 1911 passage of a \$125,000 water bond issue, part of which was earmarked for the Albion dam, Mann worked with a crew of 175 men, day and night, to complete the job. Night work was possible because the City of Boulder had executed a contract for electrical power in that area with the Central Colorado Power Company (precursor of the Public Service Company). After years of false starts, poor decisions, and lack of money, Albion Dam was finally completed in 1913.

During the summer of 1908, the Central Colorado Power Company started construction of Barker Dam on the Middle Boulder, east of Nederland. (Early schoolteacher Hannah Barker had sold the company some of her Nederland holdings for the project.) Materials for the dam building were brought in by narrow gauge railroad to the site. Eighteen months later, the dam was finished at a cost of \$1.5 million. In accordance with an agreement with the City of Boulder, the power utility brought out Barker Dam water by open conduit to Kossler Lake, then by penstock to Boulder Canyon down to Orodell across from the Lower Intake.

By carrying building material up the canyon by special rail cars which were pulled by teams of horses, Central Colorado built a small powerhouse there, later called the "hydro plant", which comprised two twelve-foot generators which produced 20,000 kilowatts of power for the Boulder area. In its day, the modest

plant operated with the "highest level" of any plant in existence and was studied with great care in later years when huge power plants became the rule in the 1930s. (Heretofore, a "light plant" near Lafayette had supplied most of the power needs for the area. In the 1960s, another agreement between the City and the now Public Service Company allowed for the establishment of piping from the powerhouse to the new Betasso Treatment and Filter Plant, where the raw water was treated before it entered Boulder pipes.)

Metering water use, at least for some of Boulder's larger consumers, had been talked about since the turn of the century. Community sentiment also dictated, however, that some water users should get their supplies free of charge.

When the ladies of the WCTU installed a drinking fountain in front of the passenger depot at Fourteenth and Water (Canyon Boulevard) Streets, they asked for and received free piping and water for their project. The Sanitarium (now Boulder Memorial Hospital), one of the City's largest out-of-town users, received free water until 1910. Columbia Cemetery, with the help of James P. Maxwell, received free water for lawn sprinkling by order of Council. (Even as late as the 1930s, free water was reserved for children's gardens.)

By 1908, the Colorado and Southern Railroad was the first out-of-town business to be metered because of its extensive water use. Two years later, the Central Colorado Power Company submitted to metering for the same reason. The community's larger dairies used a great deal of water and were also metered at this time.

Not all businesses and institutions were required to pay for their water use by meter, however, and the reasons Council advanced for meter or flat rate payment seem obscure. When a cement plant applied for Boulder water, Council decided, after lengthy discussion, that the new business would be accorded a flat rate. The newly-opened Hotel Boulderado, however, received free water for a time; Council wanted tourists at the hotel to sample Boulder's "famous" water.

Business concerns and residences were typed and grouped for appropriate flat rate use. With a \$20,000 deficit in "water rents" in 1918, sentiment changed and more and more industries were metered. Needless to say, the following year showed a \$30,000 profit in water receipts. (Boulder householders would not be metered until the early 1960s.)

1910 was the first year Council required users of Boulder water who lived outside the city limits to pay double city fees for the privilege.

Part of the 1911 \$125,000 bond issue was slated for work on the dam at Silver Lake. The original rock-fill timber-crib structure was increased to thirty-five feet in height. But construction problems were numerous; some alleged carelessness, confusion, and ineptitude at the site. The work went slowly and without promise. The building of a camp at the site was poorly done as well.

After talk of "primitive sanitary conditions"²⁷ at Silver Lake and further pollution to the area from campers and tourists, a health officer was dispatched to the site; his report concluded that the city water supply was not threatened yet, although he did mention the possibility of typhoid fever. Several outbreaks of the disease had occurred in the Boulder area. Council discussed the possibility of hiring guards for the watershed, or at least a caretaker for the premises. After all, twenty-five species of trout had been identified in the watershed -- a tremendous attraction to Colorado fishermen. At about this time, Alfred Wheeler was hired as the watershed's caretaker. Someone has been on duty ever since.

After several years and \$100,000 had gone by, Council decided, on July 23, 1914, to form an inspection party and tour the Silver Lake area. They engaged several of the newly-built Stanley Steamers, so popular in the Estes Park area, to take them
28
up the mountains.

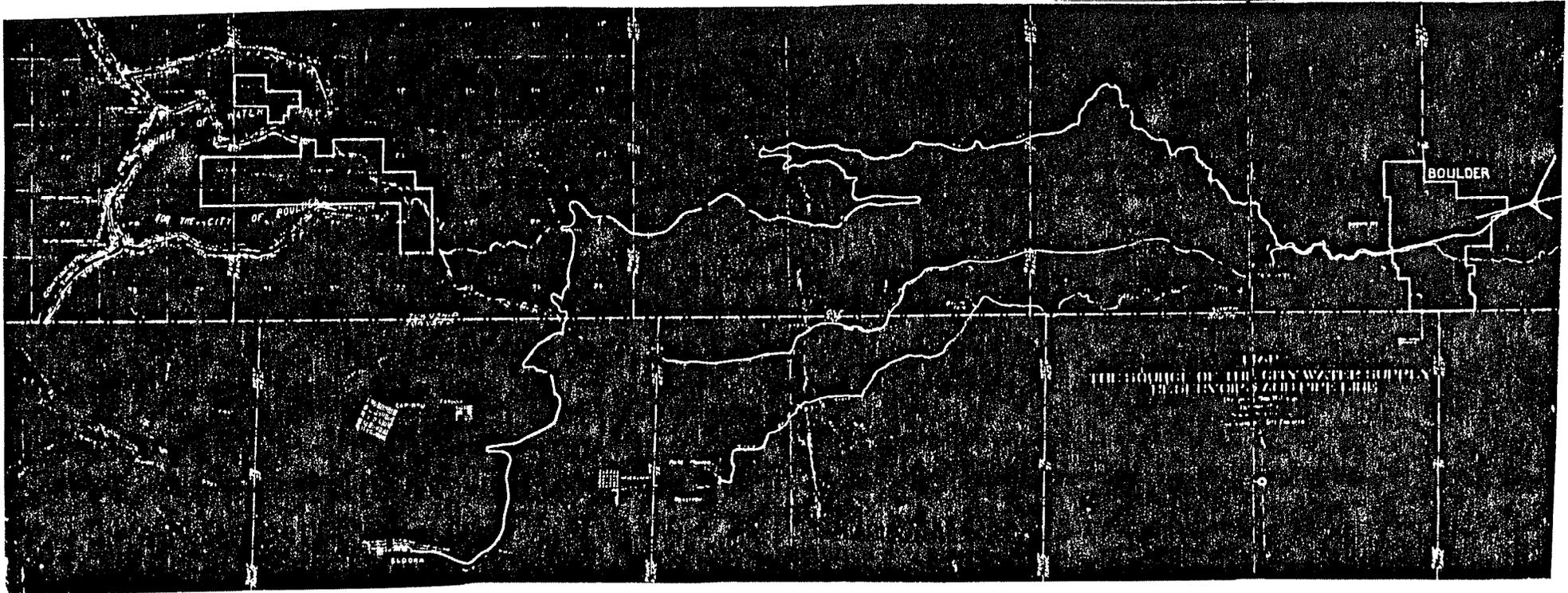


FIGURE VII

from Fred A. Fair Engineering Association: "Water Rights of the City of Boulder, Colorado," a report to E. O. Heinrich, City Manager, 1919.

Perhaps it was what Council learned from this trip to the watershed that the City concentrated on the fencing of the entire acreage. New ideas take time to be translated into action, however; it was not until 1920 that the watershed was effectively closed, except for a picnic area near Upper Boulder Falls. It was not until 1926 that the dam at Silver Lake was completed.

From time to time, winter cold snaps took their toll on the Boulder City Pipeline. Breaks occurred in 1914, 1919, and 1921, which required temporary use of a private well near Chautauqua and a spring located near the Sanitarium.

Since the area around Lakewood, site of C. F. Lake's Primos Mill, soon to become the world's producer of tungsten, was a source of possible pollution, as well as the Tucker Ranch (Van Fleet Ranch) nearby, City engineers proposed a further extension of the City line towards Silver Lake. An eighteen-inch clay tile conduit was completed in 1919 and stretched from Lakewood to two miles below Silver Lake, a distance of seven miles.

Since Boulder's domestic water supply was threatened by possible pollution from both tungsten material and human encampment, engineers proposed that Boulder water be treated for the first time. By 1917, a sort of "plant" was developed at Lakewood to treat Boulder water with chlorine and ammonium sulfate. In reality, chemicals were dumped into the water supply

at irregular seasonal intervals. Customers complained of the taste. (In 1949, chlorine was regularly added to the water year-round, it was alleged, so that customers would not notice a change of taste.)

Developments in a foreign country stopped the production of tungsten in Boulder Canyon. China offered the world tungsten market a cheaper method to manufacture the metal, a strengthening agent for iron ore; by the end of World War I, the tungsten industry declined here although there was a brief spurt of production just before World War II.

In a series of three special elections beginning in the late spring of 1917 and ending in December of that year, Boulder had its home rule convention, drafted a charter, and voted to approve it. Clair Mann, the young university student who drew the plans for Albion Dam, was secretary to the convention. City government was divided into five departments: Public Health, Public Welfare, Finance and Records, Public Safety, and Public Service; the last department housed water utilities.

Council had discussed the possibility of buying Arapaho Glacier* from the United States as early as 1909. How could they predict it would take almost twenty years of complete the purchase of the "perpetual icebox."

* Arapaho Glacier and Arapaho Indians are spelled without the final "e." Although Arapaho without an "e" is regarded as correct, Arapahoe Street uses the final "e," a spelling used by the whites.

Boulder was especially concerned that a toll road, proposed by former City Engineer Fred Fair and Colorado Springs businessman A. E. Carlton, to be built near Arapaho Peak and the glacier, would jeopardize the watershed. Rocky Mountain Park officials, however, wanted the glacier and surrounding lands also, and petitioned to extend park boundaries to the south to include the ice field.

Therefore, the United States Parks Department presented a formidable lobby against the City of Boulder. Council offered to pay \$1.25 per acre for 3,685.53 acres surrounding the glacier. The parks people objected, saying the price was too low. The matter was argued for a number of years.

One one knew for sure there was a glacier along the Continental Divide until 1900. Before that time, J. W. Barnard, a teacher at Caribou took a hike in that direction in 1892 but did not return. (In 1905 John Williams found a skull near the glacier which he identified, in some way, as Barnard's.)

H. M. Wheeler of the United States Forest Service and D. M. Andrew, a nurseryman, hiked toward the area in August 1897 but were forced back to Camp Albion because of an early blizzard.

Boulder druggist Eben Fine could find no one to hike with him on July 14, 1900, so he set off alone from Silver Lake at 6



Hikers rest beside little lake at base of Arapaho glacier.
photo, Western Historical Collections, University of Colorado
at Boulder.



1917 hikers pose in either side of glacial crevasse. photo,
Western Historical Collections, University of Colorado at
Boulder.

a.m., heading for South Arapaho Peak. He decided to cross a giant snow field; when he reached the middle of the area, Fine realized that he was standing on a "living glacier."²⁹

"If the glacial character of that snowfield had ever been suspected, certainly no word had ever appeared in print..."³⁰ The druggist was so excited that he nearly fell into one of the glacier's crevasses, but he made it home safely and said, years later, that the discovery of a glacier was a splendid way to bring in the new century.

During the Pleistocene era, this ice field may have been from ten to fifteen miles long and one thousand feet deep. Today, it is one-half mile square and two hundred feet deep. Those climbers who followed Eben Fine to the glacier rested beside a little lake which lay at its base; by 1922, it was seen no more, having, apparently, dried up. Most of the crevasses are gone as well.

After years of delay, the United States Congress finally got around to pass enabling legislation March 4, 1927; Boulder paid \$4,618 in three installments to the federal government with Rocky Mountain Park officials and Fred Fair still grumbling.³¹ United States President Herbert Hoover signed the deed on July 23, 1929.* The purchase included the four peaks along the Continental Divide and, combined with an earlier acquisition of a half section in

* Since confusion continues with regard to the date of purchase, the amount of acreage, and the price agreed upon, please refer to the deed housed in Central Files, City of Boulder.

1919 during the presidency of Woodrow Wilson, guaranteed the integrity of the western portion of the watershed.

By 1922, Boulder residents realized that the Chautauqua Reservoir was too low for safety's and pressure's sake and the storage pool was closed when a new Chautauqua Reservoir opened, built on higher ground with a larger capacity of eight million gallons.

In 1929, at the request of the Silver Lake Ditch Company, the City installed a siphon at Silver Lake Reservoir so that the ditch company's rights to the top four hundred acre feet would not be abridged. The siphon was in place for a number of years.

With the financial hard times of the 1930s came serious drought conditions throughout the West. Irrigation water users became somewhat nervous during this period; it seemed every governmental body up and down the Front Range was garnering additional water supplies. Farmers and ranchers formed the District Six Water Users Association to act as a "watchdog" group to fight some transfers of water rights to the City of Boulder and other municipalities. The trading of water, stream flows, and storage supplies became serious business in Boulder and elsewhere. Apparently, the District Six Water Users Association still held to the old adage, "You can fool around with my wife and steal my daughter, but don't mess around with my water rights."

Changing diversion points for irrigation ditches -- some of these rights dated back to the 1860s -- was used by the City to improve water quality as well as add more acre feet. The association to this day closely scrutinizes proposed water transfers and changes in diversion points, fighting some of them in water court.

By 1933, the City was "renting" water from the Green Lakes above Albion Lake; two years later, Boulder bought Green Lakes No. 1, No. 2, No. 3, and No. 4 -- former City Engineer Fred A. Fair had an option on Green Lake No. 3 for which he was paid \$7,500 -- and the tiny Green Lake No. 5 was acquired in 1937. Total cost for the Green Lakes: \$35,000.

(Green Lakes decrees include: 183.3 acre feet and 13.7 acre feet for No. 1, both dated October 2, 1906; 140 acre feet and 193 acre feet for No. 2, both dated October 2, 1906; 248.8 acre feet for No. 3 on October 2, 1906; 116.1 acre feet for No. 4 on October 2, 1906; 73.8 acre feet for No. 5 on October 3, 1907.)

During the Great Depression, young men from the W.P.A., the Work Progress Administration, and the C.C.C., the Civilian Conservation Corps, spent many hours working in the mountains to improve dams from lake to lake and piping to the upper intake.

MAP SHOWING
**SOURCE OF WATER SUPPLY OF THE
CITY OF BOULDER**
BOULDER, COLO. APRIL 1935

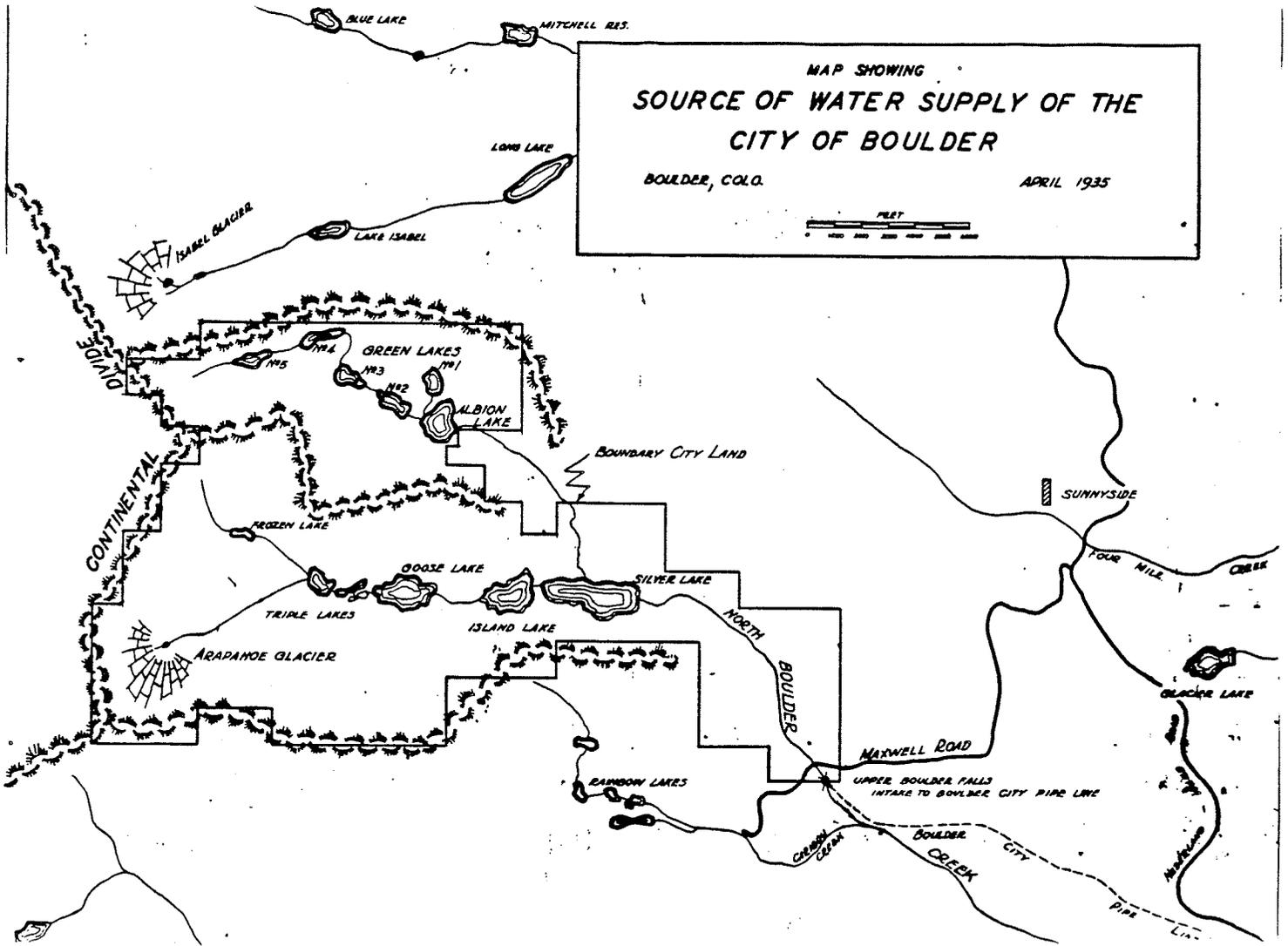


FIGURE VIII

They fenced more and more of the watershed. In 1933, they re-built the road from Silver to Albion Lakes. Their work was scheduled and based upon the recommendations of a study by the Pitometer Company of Denver, whose work was commissioned by Council in the early 1930s. Boulder received several W.P.A. grants from the federal government during the presidency of Franklin D. Roosevelt.

Workers from the C.C.C. and the W.P.A. may well have built the Betasso surge chamber during these years. The crude concrete-block facility was built on high ground, near the lower intake at Orodell, and measured some ten by twenty square feet with a 60,000 gallon capacity. A sheet-metal building covered the two diversion chambers which "slowed down" the waters speeding 3,000 feet down the mountain. It was hoped that the surge chamber would remove some of the oxygen in the water so that it would be less turbid. This surge chamber operated until 1964 when the treatment and filter plant was built at Betasso.

The Boulder Daily Camera characterized these young federal workers, who camped near the mouth of Boulder Canyon as "heroes;"

Day and night -- sometimes all night -- may be found the unsung heroes -- making repairs, improvements, and emergency replacements. They may be found in the shadow of Arapahoe [sic] glacier; along the transmission line from Blue Bird falls to the city reservoir; in the far³² extremities of the city and at the outlet of the city sewage.

During the Great Depression, public works projects did not suffer. It was a time of repair; in Boulder, as well as other communities in the United States, inexpensive labor was readily available. In 1935, young workers from the W.P.A., under the direction of Water Superintendent Carl E. Carlson, repaired the Goose Lake Dam. In 1936, construction started on a new concrete dam at Island Lake to replace the dirt-fill wall. In 1939, a steel-faced dam, thirty-five to forty feet high, was built at Green Lake No. 3; two years later a 220-foot dam was built at Green Lake No. 2 and was finished by 1944. Silver Lake Dam was refurbished in 1940; the old timber-fill structure was finally replaced with an earth-fill construction and the old 1929 siphon removed.

The Boulder Daily Camera headlined the City's special water problems during the fierce winter of 1937; some 350 water lines
33
froze solid. Four electrical thawing machines were operating constantly for a number of days until water transmission returned to normal.

Since more dry years were predicted for the 1940s, the United States Bureau of Reclamation joined forces with farmers, ranchers, cities and towns in northern Colorado and western Nebraska, located within the Platte River drainage, to form the

Northern Colorado Water Conservancy District in 1937. Together, they envisioned an immense diversion of Western Slope water to the Eastern Slope, a dream that Hiram Prince spoke of before the Colorado General Assembly forty-eight years before.

The Bureau of Reclamation agreed to pay one half of the proposed expenditure, estimated at \$44 million. By agreement, the District paid the federal government \$450,000 per year from 1961 to 1981, now pays \$500,000 per year until 1991, and will pay \$1,100,000 per year until 2001.

Construction of the complicated facility began the following year. By 1947, the first Western Slope water flowed from the Adams Tunnel to the Big Thompson and out to the plains of the South Platte drainage. Despite its promise of ample water supplies for the future, Boulder was not an original member of NCWCD, which had its headquarters in Loveland. Indeed Council considered acquiring rights to the Blue River on the Western Slope; after many years of discussion, the project was dropped. It was not until 1953 that District members grudgingly accepted Boulder as a partner in the Big Thompson project.

Despite signs that Boulder was about to "boom," the little college town of 13,000 residents "slept" its way through the 1940s, regularly voting down measures to allow serving liquor-by-the-drink and the fluoridation of City water. Letters to the

newspaper increased in volume and acidity on both of these issues. Both were poisons, opponents held, and had no place in a proper college town.

Even so, further improvements to the Boulder waterworks were made. Pipes from Orodell down to Sunshine Reservoir had already been replaced in 1922, 1926, and 1928. Lines to Chautauqua Reservoir had also received attention in 1934, 1945, 1940, and 1946. Work parties replaced eighteen-inch pipeline with twenty-two inch line from Lakewood over to Sugarloaf Hill in 1939, 1940, and 1946.

In 1942, Glacier Lake, located on Albion Creek (formerly called the north branch of the North Boulder), was purchased by the City from Stanley Bixler for \$10,500. No plans for development on Glacier Lake were seriously considered as the City wanted Glacier Lake water, as well as the supplies flowing in the Summer City Ditch, to trade for the purer waters in Silver Lake still owned by the Silver Lake Ditch Company.

(The first appropriation date for Glacier Summer City Reservoir is January 1, 1903, with the right to store 169.1 acre feet; the second decree was affirmed June 24, 1939 with the right to 688.3 acre feet. Today, decree acre feet amount to 1,499.9. The Glacier Summer City Ditch received an appropriation of ten cfs.)

During World War II, the City patriotically put \$220,000 of its water revenues into War Bonds. Although Boulder lay far from either coast, armed guards were posted near reservoirs and pipelines as a precaution against possible sabotage.

The City continued to add small parcels to its land holdings lying within the boundaries of the watershed. By 1946, some 6,000 acres of watershed territory were owned outright by Boulder. The population was growing, despite Council and some Boulder residents looking the other way. Each residential water customer used four hundred gallons of water per day, almost double the amount used in 1935. In 1947, Council re-affirmed its policy to charge outside-the-city users double for metered water and fifty-percent more for those receiving water by flat rate assessment.

Near the end of the decade, Boulder awakened from its long sleep and commissioned R. J. Tipton of Denver to complete an engineering study of Boulder's water resources. By October 1949, Tipton issued his first report. To plan Boulder's water needs for the 1970s Tipton recommended the construction of additional reservoirs, the serious and regular chlorination of water, the further acquisition of water rights, and the building of Baseline Reservoir as a method of water-trading to those who held rights to purer water in the mountains. (Boulder owns 54 shares out of 555 shares of Baseline Reservoir water, with an appropriation date of November 4, 1904.)

Tipton was luke-warm on the subject of residential meters and some charged the engineer with bowing to political pressures. Council adopted many of Tipton's recommendations, however. City water crews had already replaced the old tile conduit from Lakewood to the Upper Falls below Silver Lake with eighteen-inch steel pipe. In 1948, the Public Service Company had improved Barker Dam with a 175-foot wall measuring 720 feet long. And \$4,000 bought a chlorination plant at Lakewood for year-round use.

At the same time, long-discussed plans became a reality for the construction of a toll road between Denver and Boulder, a road that would change the character of Boulder and its water use forever.

Engineer Fred Fair had talked of such a turnpike as early as 1912 when he was directly involved in Boulder's water matters. But the engineering problems seemed insurmountable at the time; Fair was dismissed as an impossible dreamer, much as had James P. Maxwell when he proposed to build a wagon road up Boulder Canyon in the 1860s. It can't be done, many said. By 1928, however, University of Colorado Professor Roderick L. Downing was taking his advanced engineering students out in the field to survey various routes for a Denver-Boulder turnpike.

Nobody took the professor seriously because toll roads back East were in trouble for they did not pay for themselves. A Kansas consulting firm conducted a feasibility study and presented to Council and to the State of Colorado a discouraging report. The firm felt that the road would not pay for itself until 1980, if at all. Neighboring Longmont fought the proposal, charging the state was showing favoritism to Boulder.

Even so, the Colorado General Assembly passed an authorizing bill to construct a 17.3 mile road; the bonds were let and, by October 10, 1950, a first section of road had been graded from Denver to Broomfield. On January 19, 1952, the Boulder-Denver Turnpike, "the magic carpet to Progress,"³⁴ opened for business, collecting a quarter's toll from each Boulder-Denver motorist.

The term "commuter" became commonplace, and national firms began looking over Boulder as a future site. Esquire Magazine (now called Neodata) came in 1949. Arapaho Chemicals (now Syntex) had operated near the present Crossroads for several years, moving farther east in the mid-1970s. The National Bureau of Standards chose Boulder in 1950. Beech Aircraft's Aerospace Division came in 1955. Ball Brothers Research Corporation came two years later and International Business Machines bought 604 acres of alfalfa fields northeast of town. The High Altitude Observatory, which had located at the University of Colorado in 1947, now developed into the National Center for Atmospheric Research by 1960. Granville Phillips located here in 1960.

One indicator of the amazingly rapid growth in the Boulder area during the 1950s and 1960s was the closing of the toll station on the Boulder-Denver Turnpike in 1967; the roadway became the only toll road in the United States to pay for itself -- and thirteen years ahead of schedule.

Water and its future availability were often discussed by Council now. Members could not agree how to estimate the number of people that Boulder might attract in the next few years. Most of the estimates, it turned out, were far too low. Between 1950 and 1951, the number of City building permits rose 140 percent.

A former chief in the Water Department charged that the facility operated in a wasteful manner; he demanded that the office be investigated. The City Attorney did but reported that he found no evidence of waste.

The Boulder citizens themselves wasted water, winter and summer. In summer, they over-watered their lawns and gardens. In winter, in order to avoid the bills to repair frozen pipes, many residents habitually left their water taps running all the time.

NOTICE

The continual running of water from water closets, urinals, wash bowls, faucets, etc., is strictly forbidden by ordinance, and the water commissioner is instructed to shut off the water from all such fixtures after notice has been posted, unless the ordinance is complied with.

By order of the City Council.

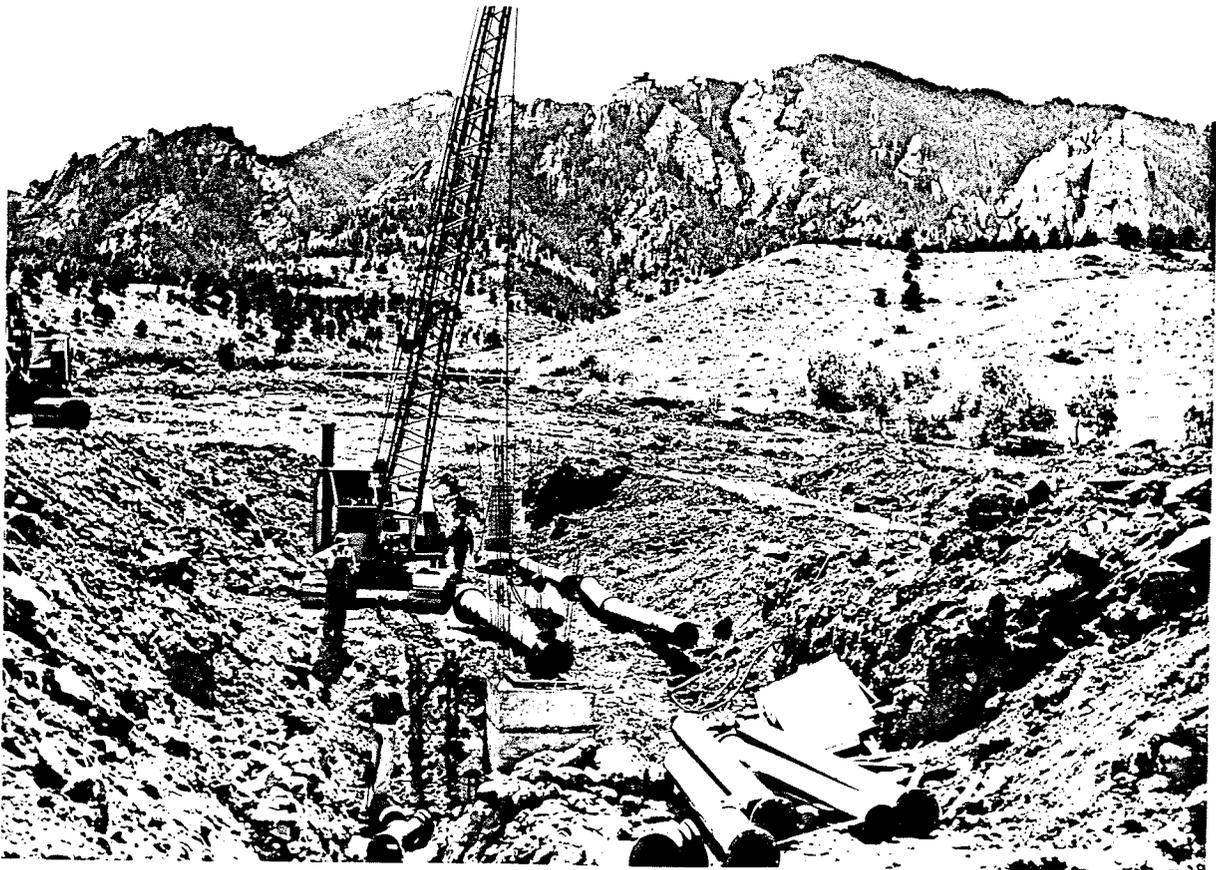
W. E. MARKS,

Water Commissioner.

Dated Boulder, Colo.,



Maxwell Reservoir, built in 1953. photo Boulder Daily Camera.



Kohler Reservoir construction in progress, June 1954. photo, Boulder Daily Camera.

They even attached a string to the faucet so that dripping water would travel down the string with no annoying noise.

In February 1952, City Manager Bert Johnson suggested to Council that heavy expenditures in the area of water supplies were necessary "to meet the requirements of the Turnpike era in our municipal history."³⁵ A \$400,000 water bond issue had passed the November before - 1999 to 192. Two new reservoirs were on the drawing boards. North Reservoir, renamed Maxwell reservoir after the notable early financier who owned that land, was built in 1953. South Reservoir was completed and renamed Kohler Reservoir after the family who owned the property before. Heretofore, Boulder was slow to pave its reservoirs; now the City took its time to cover storage pools. Kohler was covered in 1964 and Maxwell was covered in 1965.

By now, Boulder was itching to join the Northern Colorado Water Conservancy District. The possibility of receiving some 10,000 acre feet of water from the Big Thompson Project seemed so attractive that some Councilmembers voted to turn down another \$1,647,000 proposal to buy Western Slope water. Council learned that moving into the Northern Colorado Water Conservancy District would eventually increase Boulder's water supplies by fifty percent.

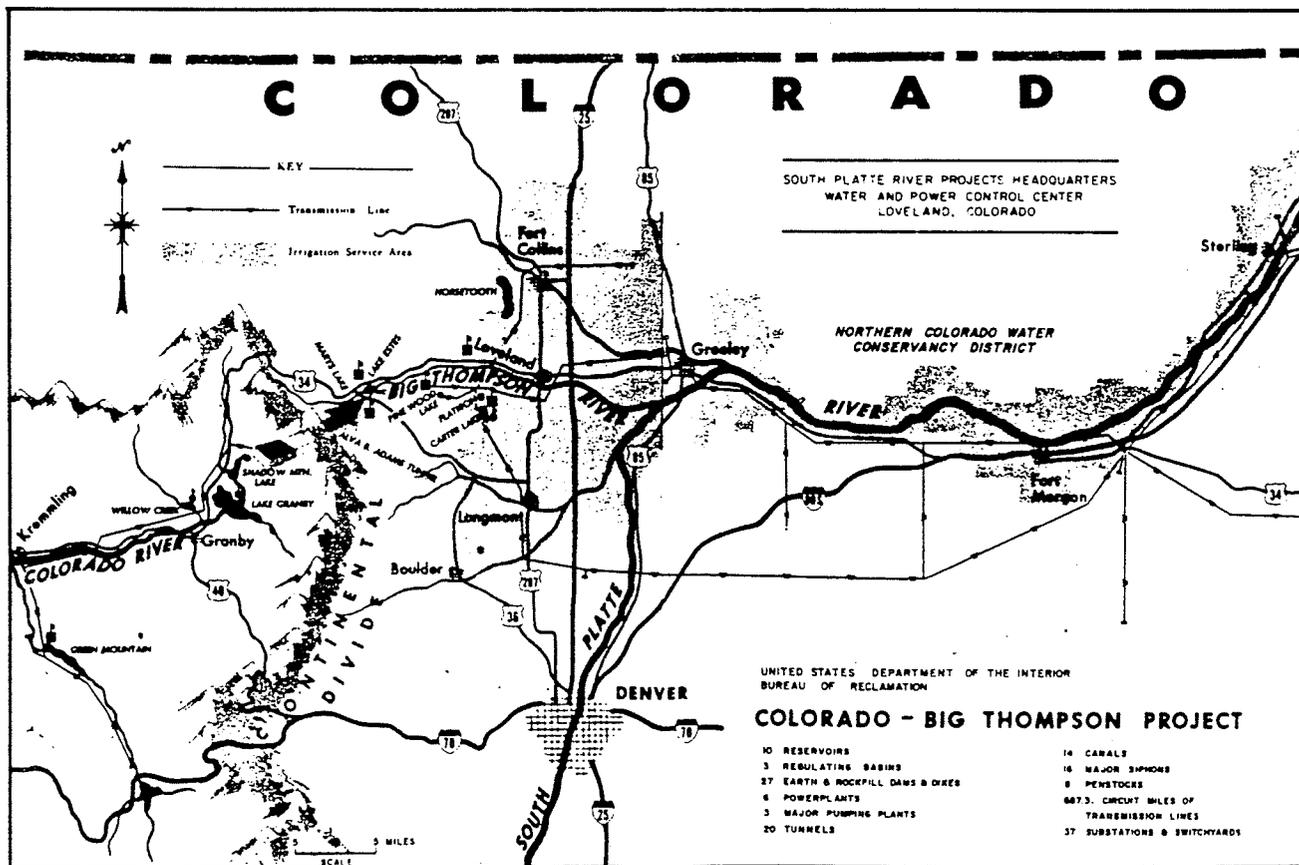
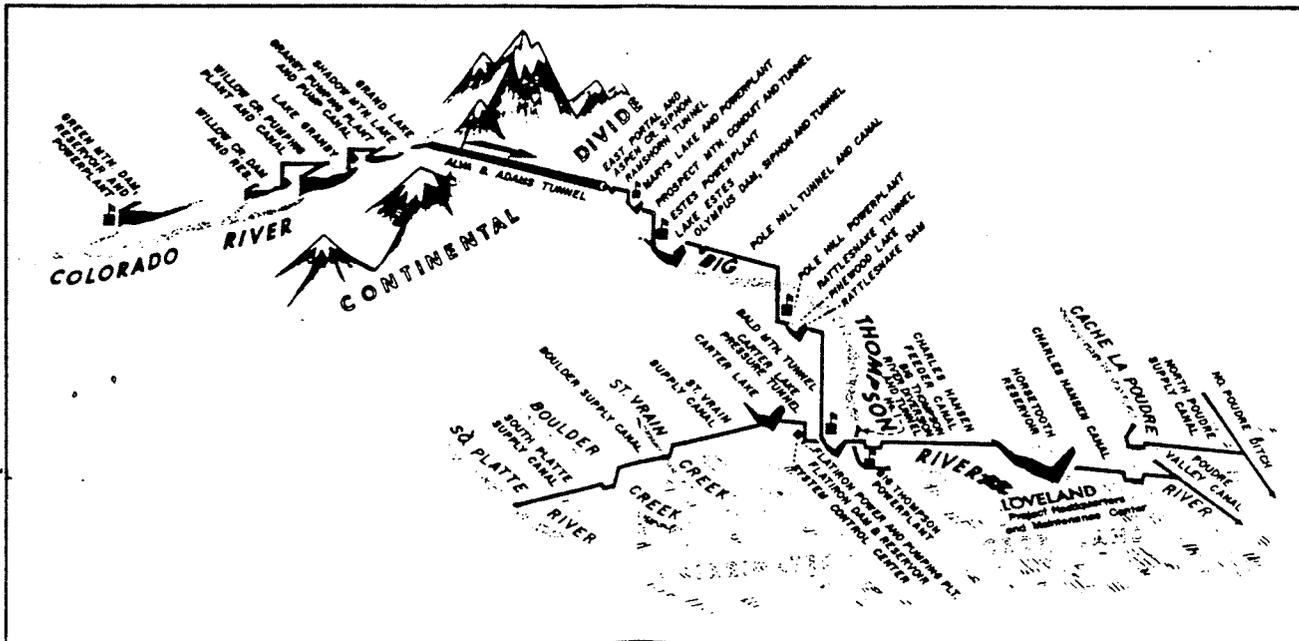


FIGURE X

Route of Big Thompson water from Colorado's western slope.

— THE BOULDER DAILY CAMERA —
 Boulder, Colorado, Wednesday, June 10, 1933

New Water Rates Effective On July 1

The new schedule of water rates was adopted by the city council Tuesday night to become effective July 1. The increased revenue will finance the new water bond issue and all other expenses of the city water utility.

The increase in charges for flat rate customers will vary according to the factors shown in the table but will average about 65 per cent. The rates per thousand gallons for meter customers, raised last year, are not changed but an increase in minimum charges will boost the bills of smaller users among meter customers.

Flat Rates Quarterly

| | Present | New |
|--|---------|--------|
| Residence, 1 to 4 rooms | \$2.50 | \$3.50 |
| Residence, 5 to 8 rooms | 3.13 | 4.25 |
| Each additional room over 8 | .31 | .50 |
| (If two or more families on one house, each is charged according to the number of rooms used.) | | |
| Baths, each | .31 | 1.00 |
| One water closet | .94 | 1.00 |
| Each additional water closet | .31 | .50 |
| Lots, per front foot | .03 | .07 |
| Stores, frontage 25 feet or less | 1.56 | 2.50 |
| Stores, frontage 26 to 50 feet | 1.88 | 3.00 |
| Stores, frontage over 50 feet | 2.19 | 3.50 |
| Example: 5-room house with one bath and one water closet, on a 50-foot lot. | | |
| | Present | New |
| 5 rooms | \$3.13 | \$4.25 |
| Bath | .31 | 1.00 |
| Water closet | .94 | 1.00 |
| Frontage | 1.50 | 3.50 |
| Total quarterly bill | \$5.88 | \$9.75 |
| Cost for one month | 1.96 | 3.25 |
| Cost for one year | 23.52 | 39.00 |

Note: Sewer service charges are billed with water charges. The sewer charges are an entirely separate item but are added to the water rents to show the total amount to be paid.

Meter Rates Quarterly Inside City

| | Present | New |
|---|---------|--------|
| First 75,000 gallons, per thousand gallons ---- | \$.25 | \$.25 |
| Next 125,000 gallons, per thousand gallons -- | .19 | .19 |
| All over 200,000 gallons, per thousand gallons | .15 | .15 |
| Minimum charges: | | |
| ¾-inch meter or smaller | 3.00 | 6.00 |
| 1-inch meter | 8.00 | 8.00 |
| 1¼-inch meter | 12.00 | 12.00 |
| 1½-inch meter | 15.00 | 15.00 |
| 2-inch meter | 25.00 | 25.00 |
| 3-inch meter | 50.00 | 50.00 |
| 4-inch meter | 80.00 | 80.00 |
| 6-inch meter | 150.00 | 150.00 |
| 8-inch meter | 250.00 | 250.00 |

Examples: For the customer using more than 24,000 gallons of water in a quarter, there will be no change in rates.

A customer having a ¾-inch meter and using less than 12,000 gallons in a quarter now pays the \$3.00 minimum and under the new rate will pay \$6.00.

A customer having a 1½-inch meter and using 20,000 gallons in a quarter now pays \$5.00 and under the new rate will pay the \$6.00 minimum.

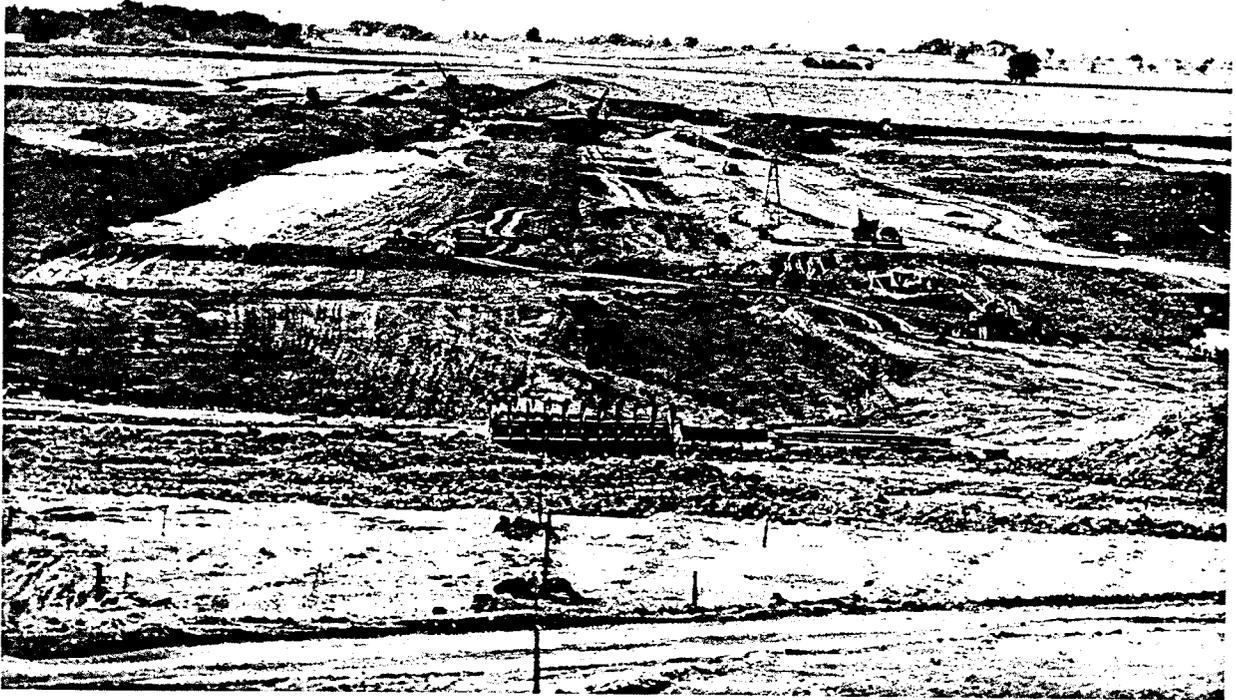
Outside City (50% higher than in city)

| | Present | New |
|---|---------|--------|
| First 75,000 gallons, per thousand gallons ---- | \$.37 | \$.37 |
| Next 125,000 gallons, per thousand gallons -- | .28 | .28 |
| All over 200,000 gallons, per thousand gallons | .23 | .23 |
| Minimum charges: | | |
| ¾-inch meter or smaller | 4.50 | 9.00 |
| 1-inch meter | 12.00 | 12.00 |
| 1¼-inch meter | 18.00 | 18.00 |
| 1½-inch meter | 22.50 | 22.50 |
| 2-inch meter | 37.50 | 37.50 |
| 3-inch meter | 75.00 | 75.00 |
| 4-inch meter | 120.00 | 120.00 |
| 6-inch meter | 225.00 | 225.00 |
| 8-inch meter | 375.00 | 375.00 |

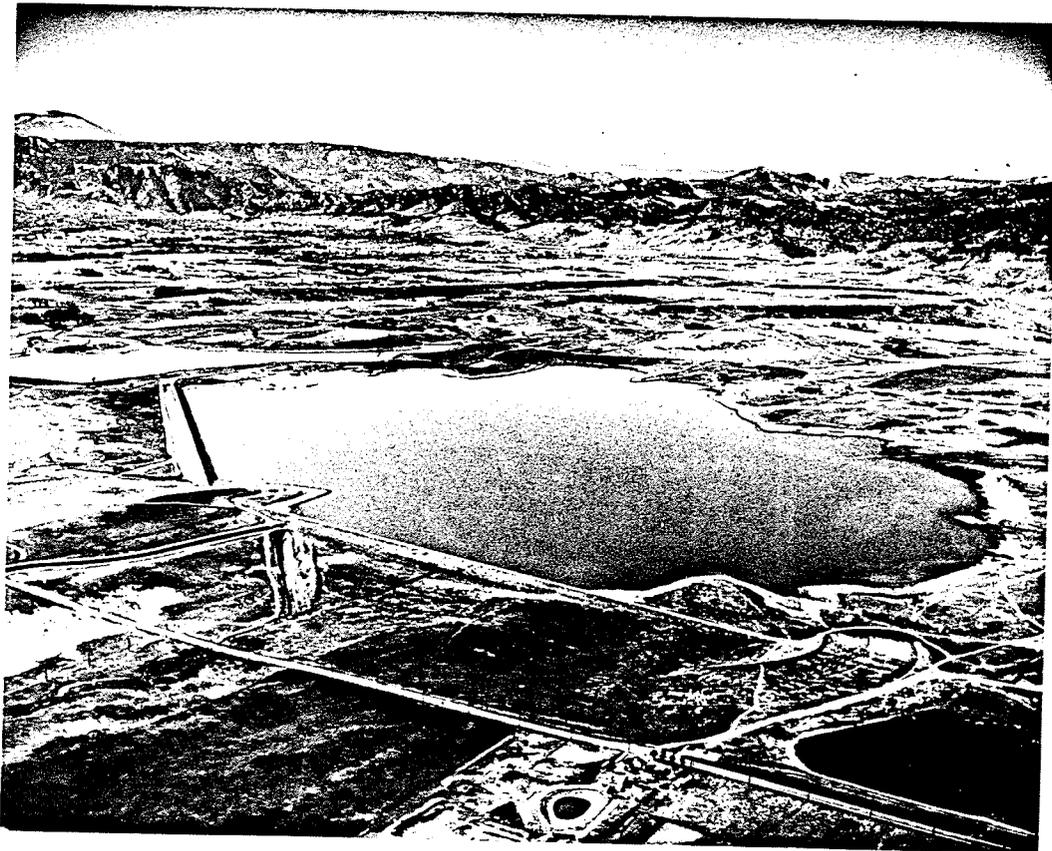
FIGURE XI

Getting "Big T" water was City Manager Bert Johnson's first priority when he was hired in 1950. Not everyone agreed with him, however. The Daily Camera was dubious about the proposed arrangement and dragged its feet editorially. After all, Boulder had just spent a great deal of money improving the waterworks. By December 1952, however, Councilmember A. A. Wickstrom, City Manager Johnson, and others were heavy into negotiations. Boulder agreed to pay its share of back taxes, plus two percent, starting with the year 1937, the year of the District's official formation.

The City also agreed to build a Reservoir at the southern end of the Big Thompson District; Boulder would put up the money, some \$1.2 million, and the District would refund \$450,000 to the City in forty installments. Boulder voters passed a \$2 million water bond issue during the summer of 1953. The enabling ordinance to join the District was approved by Council that April and citizens voted in the "now or never" June 9 election; membership in the Big Thompson Project would never be offered again. All was official on August 24, 1953. The "Big T" had grown to a waterworks of ten reservoirs, thirteen dams, four pumping stations, and miles of canals and waterways. Eventually the project would support six power plants. Boulder was surprised to learn that its share was more than the 10,000 acre feet it anticipated; the amount turned out to be 12,700, annually based on the terms of a Class B contract.



Construction begins on Boulder Reservoir, August 1954.
photo, Boulder Daily Camera.



Boulder Reservoir is filled. photo, Boulder Daily Camera.

In all of the early announcements and studies, the proposed reservoir was referred to as the Twin Lakes Reservoir. Since there were already two little Twin Lakes nearby, the Daily Camera proposed a naming contest. Hundreds of names were suggested and included Haystack Reservoir, Morning Glory Reservoir, Bouldervoir, Trade Waters Reservoir, Blue Boul Reservoir, Salvation Reservoir, and Hiram Prince Reservoir, the last to commemorate the Boulder attorney who spoke of moving water over mountain ranges in 1889.

The prosaic "Boulder Reservoir" was the choice of Council, however. When the reservoir was completed in 1955, Big Thompson water from Carter Lake near Loveland passed by Lyons, flowed through the St. Vrain Canal, through Boulder Feeder Canal, to the reservoir. In order to trade water to Boulder Creek users downstream, whose rights to water were senior to others, the City built the supply canal to the creek, measuring twelve feet wide and six feet deep.

The remainder of 1953's \$2 million water bond issue went to improvements at Silver Lake Dam (with permission from the Silver Lake Ditch Company), Green Lake Dam No. 2, and a new \$285,000 pipeline from Sugarloaf down to the Lower Intake.

That same summer, Boulder citizens had to "adjust" to new water rates, effective July 1. The revenues were to pay in part for the recently-passed water bond issue. The "pay-as-you-go" philosophy was also in effect in 1958 when, for the first time in Boulder's history, a developer was charged a tap fee, or plant investment fee, a one-time charge for new construction.

Perhaps, after several years of very large expenditures for waterworks, Boulder citizens began to weary of additional bond issues. When a proposal for a \$1.8 million bond issue was presented to the voters on July 21, 1959, they turned it down -- 1362 to 1892. Boulder's continued high rate of growth began to frighten an increasing number of citizens, as well. Those who thought of Boulder as small town wanted to continue thinking so. They didn't like the thought of Boulder as an emerging city.

When PLAN-Boulder formed in 1959, the group saw as its primary charge to attempt to slow down and direct growth in the area in order to preserve what they saw as the college town's special qualities. Other citizens called members of PLAN-Boulder a bunch of "rabble-rousers." When the City proposed the burying of water transmission lines in the foothills above Boulder, PLAN-Boulder was stimulated to draw up a proposed Charter amendment, establishing a "Blue Line," an imaginary boundary drawn through Boulder's mountain backdrop, at about 5,750 feet in elevation. West of the "Blue Line" no City water or sewer services would be

extended. PLAN-Boulder successfully petitioned Council to place the amendment on the ballot that summer; voters were to decide whether or not water or sewer utilities would be offered to foothill residents, new or old, who lived west of the 5,750 foot limit. Even though the water bond issue was defeated that year, the Blue Line amendment passed overwhelmingly.

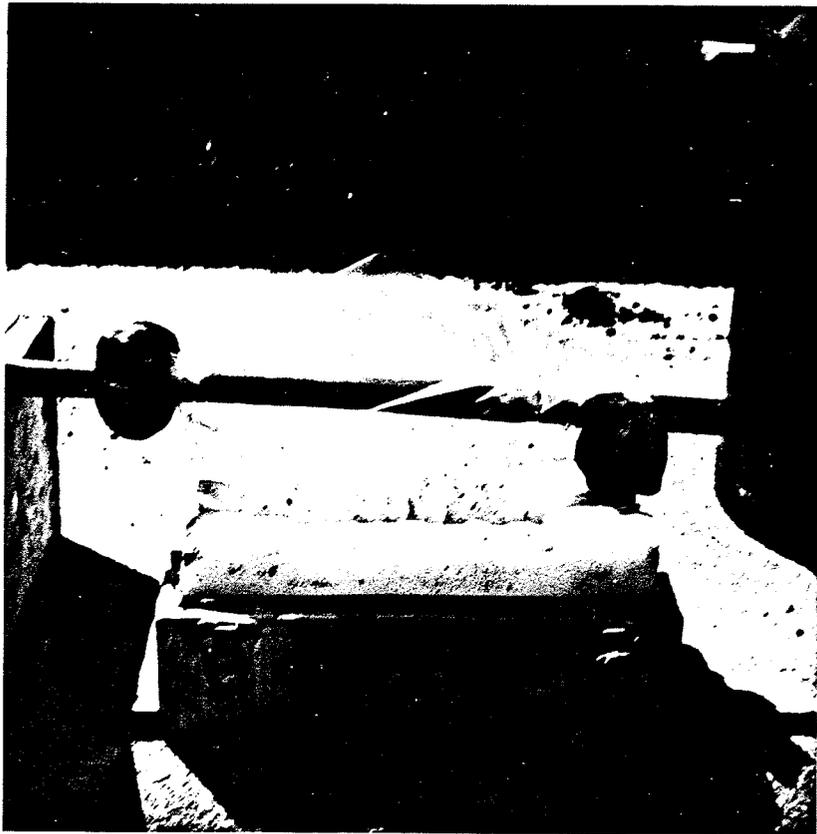
However, one and one-half years later, an exception was made to the Blue Line on the January 1961 ballot. Voters were to decide whether or not the National Center for Atmospheric Research's proposed building site on a mesa beyond the Blue Line should be accorded water and sewer services. There was considerable opposition to the exception initially but a majority of those voting felt, evidently, that NCAR's presence on the mesa would not unduly disturb the mountain backdrop; the "exception" passed 5,461 to 1,479.

After some sixty years of discussion, the City turned its attention to the installation of residential metering. Less opposition to metering seemed evident now. A \$4 million bond issue was proposed at an April 1961 election; \$700,000 of that money would be used for the construction of meter pits near some 7,500 Boulder households.

During the days preceding the election, City Manager E. Robert Turner was accused of faking the need to conserve water by



City crews install one of the first residential water meters, August 9, 1961. photo, Boulder Daily Camera.



Crawford M. Dixon's liquid nitrogen capsule. photo, Boulder Daily Camera.

summer restrictions for lawn watering and the like. Even so, the bond issue passed -- 3,471 to 1,332 -- and by the end of the year, 865 meters had been installed. The following year, 3,940 houses were metered; in 1963, 2,005 meters began operation.

Director of Water Utilities Crawford M. Dixon used liquid nitrogen cartridges on the transmission lines to freeze the water for the twenty minutes it took to install each meter line. A year or so later, most residents were not surprised to learn that residential water use had dropped some twenty percent. Those who opted to leave their faucets running through the winter now paid for the extra water. Those who ignored leaky outside sprinkler systems either repaired them or paid higher rates.

During the summer of 1959, the City of Boulder and the Public Service Company signed a new agreement which, among other items, gave the City the right to store 4,000 acre feet of water in Barker Reservoir. This doubled the amount of water the City could now store there. Under an additional agreement signed in 1968, both parties allowed that the 4,000 acre feet of City water could be stored at the reservoir until 1972, at which time the storage rights of the City would increase to 6,000 acre feet. From 1978 through 2003, 8,000 acre feet would be reserved for Boulder's use.* The City agreed to help pay for improvements to Barker Dam at a cost of \$3,315,000. A graduated schedule of rental fees were agreed to, as well as charges for the water

* a perpetual use agreement was signed in the 1980s.

flowing through the Public Service penstock to the City's new treatment and filter plant under construction on the Betasso property, two and one-half miles west of Boulder. Building of the filter plant began in 198⁶3. With its completion the following year, the old surge chamber was boarded up. A new facility to decrease turbidity in the water was included within the plant facilities. The plant could treat 28 million gallons per day. Barker Reservoir water that properly belonged to Boulder could move through the penstock - a forty-nine inch to 56-1/2 inch buried pipe - pass by the Public Service Hydro Plant, cross Boulder Creek within a twenty-inch pipe and reach the pressure-reducing chamber at Betasso.

City Manager Ted Tedesco was pleased with the 1968 contract and said, "We'll be able to leave the water in the mountains and bring it down when we need it."³⁶

At about this time, the City determined that Sunshine Reservoir was no longer needed. Pipes carrying north Boulder water bypassed the area; all that remained was a shallow depression above the Knollwood Subdivision and the scar from the piping running below the Red Rocks.

Boulder's 12,700 acre feet of water from the Big Thompson Project was augmented in 1964 with acquisition of Bijou water rights to 1,106 acre feet or a total of 13,716 acre feet.

In 1965, Council felt that at last they had one good design for controlled growth in Boulder. Perhaps a feeling of "water affluence" stimulated development of the "Service Area Concept," popularly known in the press as the "Spokes of the Wheel." One "spoke" of city sewer and water service was extended east of town along Arapahoe Avenue to Ball Brothers Research Corporation and the Boulder Valley School District facilities. Another "spoke" extended service to International Business Machines northeast on the Diagonal.

From the south of Boulder came Sam L. Rudd, who wanted to develop his 2,500 acres of property seven miles from town. Rudd proposed an industrial center as well as housing developments. His plans were enough to set off one of Boulder's periodic civic uprisings. Said one letter writer to the Camera, "If the Council can, without a vote of the people, arbitrarily decide that Boulder will supply with water we have bought for ourselves any unannexed area Council chooses, as big an area as Council chooses, at any price Council chooses... people have lost control."³⁷ Although Boulder voters turned down a sewer bond issue in March of that year, they turned around in July to approve the issue, but they voted down the Service Area Concept with evident enthusiasm.

Another water bond issue passed in 1967; \$3 million was reserved to build Boulder's second treatment plant east of Boulder Reservoir on Sixty-Third Street. Construction started that year; the plant was in operation by 1971 with a capacity to treat eight million gallons of water per day during the summer months, April through October.

Devil's Thumb Reservoir (formerly called Shanahan Reservoir) was completed at this time with a five million gallon capacity. To the northeast, Gunbarrel Reservoir was constructed as well, with a potential storage of two million gallons.

The City acquired another mountain reservoir in 1966. Nurseryman Everett Long sold his family-owned Skyscraper Reservoir to Boulder. Located southeast of the watershed, within United States Forestry Department land on Woodland Creek, the rights acquired to storage were used to trade water.

(Skyscraper Reservoir rights were adjudicated in 1953 with a decree date of July 24, 1940 to 146.4 acre feet.)*

* Earlier, the City acquired storage rights to Park Reservoir which lay within United States Forestry Department boundaries. Its decree date is October 11, 1960, with separately filed rights to store 6,767 and 2,764 acre feet of water. Further, the City holds conditionally-decreed rights to 15,062 acre feet in the Bradley Ranch Reservoir. The decree date is January 6, 1961.

WATER RIGHTS OWNED BY THE CITY
(August 16, 1966)

| <u>Priority Number</u> | <u>Name</u> | <u>Priority Date</u> | <u>Amount</u> |
|---|-----------------------------|--------------------------|---------------|
| <u>Direct Flow Rights Presently Usable Directly in System</u> | | | |
| 4 | New Anderson Ditch * | 10- 1-1860 | 11.998 cfs |
| 14 | Farmers Ditch * | 10- 1-1862 | 14.586 cfs |
| 37 | Town of Boulder Ditch | 6-17-1875 | 6.189 cfs |
| 4 | Boulder City Pipeline | 2- 9-1904 | 20.000 cfs |
| 12-3rd | Boulder City Pipeline Enlg. | 12-31-1947 | 10.000 cfs |
| 17-3rd | Boulder City Pipeline No. 3 | 5-15-1956 | 20.000 cfs |
| <u>Storage Rights Usable Directly in System</u> | | | |
| 11-N.S. | Silver Lake | 9-23-1887 | 807.3 A.F. |
| 4-Dom. | Silver Lake (Refill) | 9- 3-1906 | 807.3 A.F. |
| 29-3rd S. | Silver Lake | 9- 6-1928 | 322.3 A.F. |
| 38-3rd S. | Silver Lake | 12-31-1941 | 1,181.0 A.F. |
| 38-3rd S. | Silver Lake (Conditional) | 12-31-1941 | 1,839.0 A.F. |
| 13-N.S. | Island Lake | 7-15-1890 | 371.8 A.F. |
| 4-Dom. | Island Lake (Refill) | 9- 3-1906 | 371.8 A.F. |
| 29-N.S. | Goose Lake | 10- 1-1901 | 198.5 A.F. |
| 4-Dom. | Goose Lake | 9- 3-1906 | 261.2 A.F. |
| 28-3rd S. | Goose Lake | 12-31-1907 | 576.6 A.F. |
| 19-3rd S. | Lake Albion | 7- 1-1910 | 1,110.9 A.F. |
| 11-3rd S. | Green Lake No. 1 | 10- 2-1906 | 183.3 A.F. |
| 28B-3rd S. | Green Lake No. 1 | 10- 2-1906 | 13.7 A.F. |
| 12-3rd S. | Green Lake No. 2 | 10- 2-1906 | 140.0 A.F. |
| 28B-3rd S. | Green Lake No. 2 | 10- 2-1906 | 193.0 A.F. |
| 13-3rd S. | Green Lake No. 3 | 10- 2-1906 | 248.8 A.F. |
| (No Decree) | Green Lake No. 3 | (No Decree) | 36.2 A.F. |

* Transferred

FIGURE XII

TABLE 4 (Cont'd)
 WATER RIGHTS OWNED BY THE CITY
 (August 16, 1966)

| <u>Priority Number</u> | <u>Name</u> | <u>Priority Date</u> | <u>Amount</u> |
|---|--|--------------------------|-------------------|
| <u>Storage Rights Usable Directly in System (Cont'd)</u> | | | |
| 14-3rd S. | Green Lake No. 4 | 10- 2-1906 | 116.1 A.F. |
| 15-3rd S. | Green Lake No. 5 | 10- 3-1907 | 73.8 A.F. |
| 4 -3rd S. | Barker Reservoir (Conditional) | 5-15-1956 | 4,000.0 A.F. |
| 5 -3rd S. | Bradley Ranch (Conditional) | 1- 6-1961 | 15,062.0 A.F. |
| <u>Ditch Company Stock</u> | | | (Shares) |
| 2 | Smith & Goss Ditch | 11-15-1859 | 1 of 210 |
| 4 | New Anderson Ditch ** | 10- 1-1860 | 54-111/120 of 100 |
| | Howard Ditch | 4- 1-1862 | 14-128/149 of 100 |
| 1 | McCarty Ditch | 6- 1-1862 | 293 of 666 |
| 14 | Farmers Ditch ** | 10- 1-1862 | 21.2832 of 100 |
| | Dry Creek No. 2 Ditch | 5- 1-1864 | 22.084 of 300 |
| 3 | Wellman Ditch | 5- 1-1878 | Unknown |
| 13-3rd S. | S. Boulder & Foothills Ditch | 12-31-1883 | 13 of 30 |
| | Lefthand Ditch Company | --- | 1-3/4 of 105 |
| <u>Storage Rights and Imported Water Owned and Usable by Trade Only</u> | | | |
| | Baseline Reservoir | | 54 of 555 shares |
| | Glacier Lake | | All |
| | Northern Colorado Water Conservancy District | | 13,716 A.F. unit |

* Includes that portion transferred to watershed.

from Black and Veatch
 study; see Sources

From time to time, the integrity of the watershed came under attack by those who wanted to use the area for other purposes. Some recreation-minded citizens and businessmen questioned the propriety of guarding "unused" land. Others boldly walked into the property until they were asked by leave by caretaker personnel. In 1967, the City survived a fairly serious threat by several "sportsmen's" groups who wanted special access to the lands beneath the glacier for hunting and fishing activities.

The question of whether Boulder water should be fluoridated was on the November 1969 ballot and caused another spate of angry letter writers to the Daily Camera. The issue of fluoride addition had been simmering for years; the question had been soundly defeated three times before.

In 1903, a Colorado Springs dentist noticed that some of his patients native to Colorado had a brown mottling on their teeth, a condition that became to be called "Colorado brown stain." Natural fluorides present in the water of some Colorado communities caused the mottling. Boulder water had some fluoride in its drinking water but many residents, including most of the area's dentists, felt that additional fluoride was essential to the formation of healthy teeth in children.

Those who found nothing wrong with the additive could not understand the "backwardness" of fluoridation opponents and wrote

somewhat condescending letters to the newspaper supporting the issue. Opponents regarded fluoridation as a form of mass medication; citizens would no longer have freedom of choice if they were forced to drink fluoridated water. Some nervous residents asked about those who might be allergic to fluorides. Can they cause disease? Cancer? Gum problems? Those against the additive supported the Clifton Plan, a system of distributing free fluoride tablets to those families who wished their children to be so protected. After weeks of discussion and argument, Boulder votes finally approved fluoridation of City water.

By 1966, six northern Colorado communities -- Boulder, Estes Park, Fort Collins, Loveland, Greeley, and Longmont -- got together to discuss the possibility of increasing their water supplies with the formation of a municipal subdistrict under the Northern Colorado Water Conservancy District. Big Thompson water rates had been rising an average of twenty-four percent per year for quite some time. The six communities, with their collective eye upon the Western Slope waters of the Colorado River and the Fraser River (a Colorado River tributary), filed for a decree in water court, after consultation with their consultants, ECI, Inc.

By February 1969, the "Six Cities" group had worked out the details of such a scheme, now popularly called the Windy Gap Project, which would, for the most part, use the already-constructed facilities of the Colorado-Big Thompson Project to

carry water supplies eastward across the mountains and take advantage of the unused capacity of the Colorado-Big Thompson system. Even so, it would still cost members an estimated \$84 million. Not surprisingly, members of the Colorado River Conservancy District strongly expressed their disapproval of a project which would remove more Western Slope water to the Eastern Slope. They filed suit.

Fighting over the water continued through the 1970s; in 1979, the Colorado Supreme Court handed down its decision which held to a conditional decree of 48,000 acre feet of Western Slope water to be divided by the six communities. Boulder would receive some 8,000 acre feet. One local weekly headlined Boulder's interest in new water supplies as, "City Hears Patter of Little Acre Feet."³⁸

Construction of Windy Gap facilities began in 1981; the project was dedicated during the summer of 1985. (Fort Collins left the Six Cities group early on and sold its portion to the Platte River Power Authority.)

In 1972, water rates rose again but with little complaint. Water news came from another direction that year. Businessman Lawrence Robinson stated to Council his intention to develop his Gunbarrel property of eighty acres. Others with property east of the city limits echoed Robinson with plans of their own. Council

was not happy with what it saw as a method to end-run its directed growth policies and denied Robins's request for water and sewer services.

Seven years had passed since Boulder voters had turned down Sam L. Rudd's development scheme for much the same reasons. For four years, the case was in the courts; in 1976, the Colorado Supreme Court handed down a decision stating that a municipality may not deny a developer's request for water services for growth-related reasons. The court went on to state that since the City had assumed the role of a public utility in the Boulder Valley -- having extended service in other directions outside the City -- it could turn down requests only if its physical capacities for providing such services were severely limited. Boulder, the court said, did not fit that category. What about the future, asked Councilmember Paul Danish; why couldn't Boulder try to prove to the courts that the City would need these waters supplies in the years to come.

Assistant City Attorney Mary Grumbine told Council she doubted that a denial of present services because of future needs would hold up in court. Shortly after the Supreme Court decision, Council annexed the Robinson property in Gunbarrel. Other developers got in line for their service requests.

The Treatment Plant at Betasso doubled its capacity in 1976 with a \$2.4 million expansion. Now the plant could treat fifty million gallons of raw water per day. However, EMA, Inc., a St. Paul, Minnesota, water consultant firm, issued its commissioned report shortly after the Betasso expansion stating that Boulder still did not have sufficient capacity to treat water for its growing population. The firm went on to recommend greater use of computers for day-to-day operations.

Everywhere, it seemed, the price of water was going up. By 1977, Big Thompson water sold for \$850 per unit.* Even so, Boulder was able to purchase some of its Big Thompson water that year for less than the going rate.

In 1979, residential water rates rose some seventeen percent; sewer rates doubled. These were the first rate changes since 1982. Now the average Boulder householder paid \$99.89 per year for water and sewer services rather than \$85.04 per year.

1981's "dry" winter set a record for the area. Utilities Director Roger Hartman called for cuts in consumption by the major users.

During the 1980s a number of Boulder area residents became interested in the potential of hydroelectric power. Jim Guercio, owner of Caribou Ranch, served notice that he would file with the

* an acre foot was not a standard, unchanging yearly measure; each spring, the NCWCD estimated its water supplies and determined what a unit should be .

Federal Energy Regulatory Commission for a permit to build a hydroelectric facility on his property. Councilmember Phil Stern encouraged the City to file for permits as well. By the mid-80s, with permits in hand from the FERC, the City had completed a hydroelectric generating facility at Maxwell reservoir -- which was in operation -- and construction began at Kohler Reservoir, at Sunshine Station above Fourth Street at Mapleton Avenue, and at Betasso itself. Another plant was designed for construction in the Orodell area. Betasso's hydroelectric generating facility would cost \$3 million, approved by Boulder voters in May 1984. Betasso would produce power that the Public Service Company would purchase.

Residential price of water rose again in 1982; this time the higher rate averaged thirty-six percent. Instead of paying forty-six cents for each 1,000 gallons used, the citizen now paid sixty-six cents per 1,000 gallons for a yearly average bill of \$136.59.

The following year, water and sewer rates rose again; residents now paid seventy-seven cents per 1,000 gallons used; their yearly bill have averaged \$188. Some complained but a Denver Post survey showed that Boulder had the third lowest water and sewer charges in the area. (See Figure XIII.)

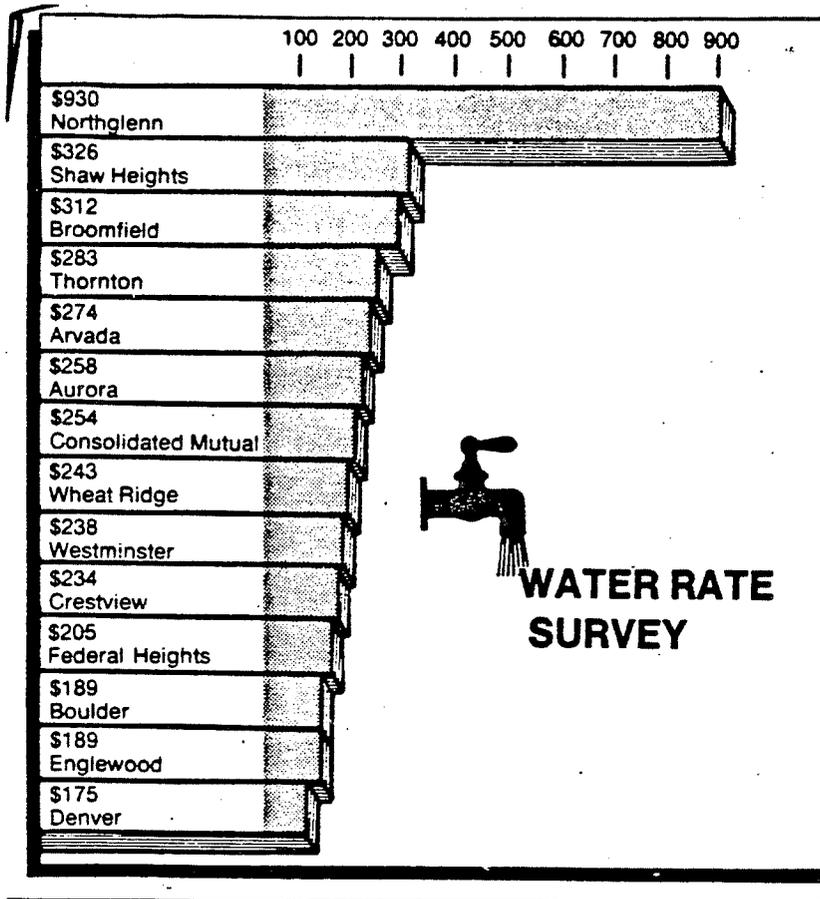


FIGURE XIII

In May 1983, the ever-alert Boulder environmentalists had a new problem. In order to better regulate water flow from Chautauqua to Kohler and Devil's Thumb Reservoirs, City officials called for a new pipe to be laid underground through part of Enchanted Mesa, parallel to the existing pipeline. Water Utilities Director Roger Hartman explained to the public that if the transmission line went by way of Enchanted Mesa, the bill would be \$585,000. However, if the City were forced to go under the existing streets, costs would rise to \$999,000. Hartman told Council he might have to charge a two-cent per 1,000 gallon surcharge in order to pay for the more expensive route.

Councilmembers realized that few citizens would stand for pipes running through Enchanted Mesa, even underground. Councilmember George Boland spoke of previous "scars" nearby. To avoid going through the greenbelt, the two-cent surcharge was adopted; Councilmember Greg Lefferdink dubbed it the "environmental surcharge." After peace had returned to civic matters, at least for a time, Hartman found out that the pipe estimates were high; he did not have to charge extra after all.

In 1983, Boulder's residential water use dramatically increased. That summer, some 85,000 residents dispatched forty million gallons per day. Two years later, at the height of summer water use, citizens consumed, in some manner, forty-five million gallons on July 5, another record.

In September 1985, after several months of geotechnical investigations of dams in the watershed, a consultant told the City what it had already learned from state engineers. The old steel-faced dam at Green Lake was no longer able to safely contain three hundred acre feet of water the following spring due to deterioration of the steel face and the instability of the base. That being the case, City officials ordered that the dam be partially breached so that only one hundred acre feet would be stored there with the next spring runoff.

By late fall of 1985, Boulder's water meter readers went modern and shed their cumbersome metal-backed notebooks for small hand-held data capture devices to complete their monthly rounds.

Since the turn of the century, when Boulder waterworks operators had the good sense to pipe up the mountains to the purer waters of North Boulder Creek, Boulder residents have enjoyed far better drinking water than most communities in the United States. It tasted good, it looked good - most of the time - it was not overly hard, and seldom had anyone found serious fault with the organic or inorganic content of the water as it flowed into the waterworks.

Thus, it was cheaper to treat such high quality supplies. Boulder citizens also paid less for specialized pumping machinery since most of the waterworks operated by simple gravity.

Although Boulder had not apparently resorted to the "shovel diplomacy" of the California miner of the 1850s, the community had been called a "water pirate" from time to time by its neighbors and fellow water users.

Even though many Boulder residents "slept" through the 1940s and 1950s, hoping to avoid the unmistakable signs of growth along the Front Range -- some still mourn and yearn for the town that was -- a number of far-sighted residents, City officials, and Councilmembers" had the foresight to go after it."³⁹ The people can be proud of their waterworks.

END NOTES

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2. Andy Briscoe, Coordinator of Public Utilities, City of Boulder, Boulder Daily Camera, May 24, 1970.
3. Boulder Pioneer, February 10, 1869.
4. Boulder Daily Camera, June 12, 1977, article by Todd Malmsbury quoting George Vranesh.
5. Phyllis Smith: "The Race for Water; an historical perspective," Boulder Daily Camera, October 7, 1984.
6. *ibid.*
7. Town Minutes, January 10, 1873.
8. Town Minutes, November 29, 1872, Boulder County News, January 10, 1873.
9. Boulder County News, January 2, 1874.
10. Town Minutes, April 22, 1876.
11. Colorado Banner, October 7, 1875.
12. Town Minutes, October 5 and November 25, 1875.
13. quoted from Fred Fair Engineering Association: "Water Rights of the City of Boulder, Colorado, 1919," Appendix B, p. 7.
14. Boulder County Herald, July 18, 1889.
15. *ibid.*, April 5 and 19, 1882.
16. Town Minutes, October 23 and November, 1879, January 5 and February 2, 1880.
17. See articles by Beth Mende Conny, Silver and Gold Record, September 19, 1985.
18. Boulder County Herald, August 15, 1883.
19. Boulder County Herald, February 26, 1890 and July 23, 1890.
20. Boulder County Herald, March 26, 1890.

21. Boulder Daily Camera, October 20, 1891.
22. Boulder Daily Camera, June 20, 1893.
23. "The Story of the Colorado-Big Thompson Project," United States Bureau of Reclamation, (Washington D.C., U.S.G.P.O. 1962) p.5.
24. Boulder Daily Camera, February 14, 1896.
25. Council Minutes, January 4, 1897.
26. Council Minutes, April 1898, May 1899, December 18, 1901, Boulder Daily Camera, March 22, 1900.
27. Howard, Phelps Eastwood: "A Sanitary Engineering Study of the Boulder Water Supply," Bachelor of Science degree thesis, University of Colorado at Boulder, 1916.
28. Focus, Boulder Sunday Camera, July 19, 1964.
29. Eben Fine: Remembered Yesterdays, (Boulder, Colorado: Johnson Publishing Company, 1957) p. 15.
30. *ibid.*, p. 13.
31. Boulder Daily Camera, February 15, 1929.
32. *ibid.*, February 27, 1936.
33. *ibid.*, January 17, 1937.
34. Boulder Progress, June 1957, publishing by National State Bank, Hugh McCaffrey, ed.
35. "Water Utility Improvements," Bert W. Johnson to Members of City Council, February 1, 1952.
36. Boulder Daily Camera, July 24, 1968.
37. *ibid.*, May 12, 1965, letter by Florence Sibert.
38. Town and Country Review, article by Berny Morson, July 10, 1974.
39. Boulder Monthly Magazine, June 1979, article by Alice Trembour quoting water attorney George Vranesh.

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Long, Everett: former president, Silver Lake Ditch Company, interview, 1985.

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A CHRONOLOGY OF THOSE WHO HAVE CONTRIBUTED TO THE DEVELOPMENT
OF THE WATERWORKS, BOULDER, COLORADO

- Ephraim Pound: President, Town Trustees, 1875: First Water Commissioners, 1875-1877
- S. D. Silver: Water Commissioner, 1877
- O. E. Henry: Engineer, 1877
- J. S. Titcomb: Engineer 1881
- Samuel Piper: Water Commissioner, 1883
- H. E. Washburn: Superintendent of Water, 1887 (The title of "Water Commissioner" changed to "Superintendent" at about this time)
- Hendry Johnson: Street and Water Superintendent, 1892
- George W. Teal: City Engineer, 1892-1896
- W. W. Wells: Superintendent of Waterworks and Sewers, 1898-1907, 1908
- James P. Maxwell: City Engineer, 1901-1908
- James M. Platt: District Water Commissioner, 1907-1932
- Fred A. Fair: City Engineer, 1908-1909
- S. A. Crandall: Superintendent of Waterworks and Sewers, 1908
- Thomas E. Barry: Superintendent of Waterworks and Sewers, 1911-1918
- Fred R. Dungan: City Engineer, 1909-1912
- H. E. Phelps: City Engineer, 1913
- Nels Jacobson: Streets Superintendent, built Goose Lake Dam in 1908
- Alfred Wheeler: first caretaker of the watershed, 1913
- George R. Joslyn: City Engineer, 1916-1918
- Jay Randolph: City Engineer, 1921-1923
- John J. Morse: Superintendent of Water and Sewers, 1922-1934

Earle W. Devalon: City Engineer, 1926-1927

Harold C. McClintock: Director, Department of Public Service and City Engineer, 1930-1946

Thomas L. Platt: District Water Commissioner, 1932-1974

Carl E. Carlson: Superintendent of Water and Sewers, 1935-1948

Owen Cole; caretaker of the watershed, 1932-1935

A. B. Venrick: caretaker of the watershed, 1943

Michael E. "Pike" Shanahan: Acting Superintendent of Water and Sewers, 1943-1948, caretaker of the watershed, 1956-1959

L. Earl Markham: caretaker of the watershed, 1944-1956

George R. Hubbard: Director, Department of Public Service and City Engineer, 1948

Crawford M. Dixon: Director, Department of Public Service and City Engineer, 1951-1952; Director of Water Development, 1953-1955; Director of Water and Sewer Divisions, 1956-1961; Director Water Utilities, 1961-1965

Trafton Bean: Director, Department of Public Service, 1953-1954

Willi Duchow: Civil Engineer, 1957-

Orville Hollis: meters, 1961-1963

Howard D. McMahan: Coordinator, Water Development, 1961-1963

Joe Jenkins, caretaker of the watershed, 1959-1961

Thomas E. Platt: caretaker of the watershed, 1961-

William Korbitz: City Engineer, 1962; Director Department of Public Works, 1964-1965

Ernest Hamilton: Director, Sewer Utilities, 1964-1975

Wallace McClure: Director, Water Utilities, 1965-1968; Superintendent of Water Treatment, 1969-1970

Howard Cox: City Engineer, 1966; City Utilities Engineer, 1967-1968

Ted Diefenderfer: City Engineer, 1966; Flood Control Coordinator, 1974-1975

Charles R. Weir: Superintendent, Water Treatment, 1967

William Light; Director, Department of Public Service and City Engineer, 1954-1964; Director of Public Utilities, 1964-1969; Director of Water Resources, 1971-1983

Robert G. Westdyke: Director, Water Utilities, 1967-1972; Director Public Facilities, 1972-1974; Director, Department of Public Works, 1974-1975

Andy Briscoe: Director, Department of Public Facilities, 1970

Andy Hollar: Director, Water Utilities, 1972-1976; Director, Department of Public Works, 1976-1983; Director, Water Utilities, 1984-1986

Sam Hobbs: Director, Department of Public Service, 1973-1975

Don R. Douglas: Director, Public Utilities, 1974-1975; Director, Water Utilities, 1975-1977

Doug Smith: Director, Water and Wastewater Utilities, 1977-1979; Director, Wastewater, 1975-1977

Roger Hartman: Director, Water Utilities, 1979-1983

Jim Carmody: Superintendent, Water Treatment, 1970-

Bob Wheeler: Water Treatment Coordinator, 1981-1986; Acting Director, Water Utilities, 1986-

David Rhodes: Director, Department of Public Works, 1985-